



Department of Transportation

Office of Project Development

700 E Broadway Avenue

Pierre, South Dakota 57501-2586 605/773-3268

FAX: 605/773-2614

November 25, 2015

ADDENDUM NO. 1

RE: Item #1, December 2, 2015 Letting - IM 0293(96)73, IM 2292(90)0, PCN 01QS, 020Q, Lincoln, Minnehaha County - Grading, Structures, PCC Surfacing, Lighting & Utilities

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: Please remove the Special Provisions checklist and replace with attached Special Provisions checklist revised 11/25/15.

Please remove the "Special Provision for Contract Time", dated 11/6/15 and replace with the "Special Provision for Contract Time", dated 11/25/15 and remove the "Special Provision for Next Generation Concrete Surface (NGCS) Grinding of PCC Pavement", dated 11/6/15 and replace with the Special Provision for Next Generation Concrete Surface (NGCS) Grinding of PCC Pavement", dated 11/24/15.

BID ITEM FILE: *Bidders must log in to retrieve the addendum bid item file that must be loaded into the SDEBS to incorporate the revisions listed here.*

Bid Items were added:

Bid Item 380E6505 "NGCS Grinding PCC Pavement"

Bid Item 380E6510 "Grinding PCC Pavement"

Bid Item 450E0130 "18" RCP, Install"

Bid Item 460E0215 "Grooving Bridge Deck"

Quantities for Bid Items were changed:

Bid Item 632E3105 "Extruded Aluminum Sign, Removable Copy Super/Very High Intensity" changed from 2,685.0 to 7,875.8 SqFt

Bid Item 634E0640 "Temporary Pavement Marking" changed from 108,610 to 214,208 Ft

Bid Items were removed:

Bid Item 450E0129 "18" RCP for Jacking, Furnish"

Bid Item 632E3103 "Extruded Aluminum Sign, Removable Copy High Intensity"

PLANS: Please destroy sheets A2 through A5, B2, B5, B15, B16, C2, C3, C4b, E2, E52, E54, E55, E66, E77, E85, E87, E88, E99, E110, F2, F6, F7, and S2 and replace with the

enclosed sheets, dated 11/23/15 and 11/25/15. Sheets F7a and F48a through F48L were added.

Sheet A2: Grading – Section B (020Q)

Bid Item 450E0129 “RCP for Jacking, Furnish” was removed.
Bid Item 450E0130 “18” RCP, Install” was added

Traffic Control – Section C (01QS)

Quantities for Bid Item 634E0640 “Temporary Pavement Marking” changed from 99,634 to 196,256 Ft

Traffic Control – Section C (020Q)

Quantities for Bid Item 634E0640 “Temporary Pavement Marking” changed from 8,976 to 17,952 Ft

Sheet A3: Structure 42-066-006 – Section E (01QS)

Bid Item 460E0215 “Grooving Bridge Deck” was added

Sheet A4: Structure 42-067-006 – Section E (01QS)

Bid Item 460E0215 “Grooving Bridge Deck” was added

Surfacing – Section F (01QS)

Bid Item 380E6505 “NGCS Grinding PCC Pavement” was added
Bid Item 380E6510 “Grinding PCC Pavement” was added

Surfacing – Section F (020Q)

Bid Item 380E6505 “NGCS Grinding PCC Pavement” was added
Bid Item 380E6510 “Grinding PCC Pavement” was added

Sheet A5: Permanent Signing – Section S (01QS)

Bid Item 632E3105 “Extruded Aluminum Sign, Removable Copy Super/Very High Intensity” was added
Bid Item 632E3103 “Extruded Aluminum Sign, Removable Copy High Intensity” was removed

Sheet B2: PCN 020Q

Bid Item 450E0130 “18” RCP, Install” was added
Bid Item 450E0129 “18” RCP for Jacking, Furnish” was removed

Sheet B5: WASTE note was added.

Sheets B15 & B16: Borrow Pit Information Layouts were revised.

Sheet C2: PCN 01QS

Quantities for Bid Item 634E0640 “Temporary Pavement Marking” changed from 99,634 to 196,256 Ft was changed

PCN 020Q

Quantities for Bid Item 634E0640 “Temporary Pavement Marking” changed from 8,976 to 17,952 Ft

Sheet C3: PHASE IIIb and PHASE IV were revised.

Sheet C4b: TEMPORARY PAVEMENT MARKING note was revised.

Sheets E2: Structure 42-066-006
Bid Item 460E0215 "Grooving Bridge Deck" was added
Structure 42-067-006
Bid Item 460E0215 "Grooving Bridge Deck" was added

Sheets E52, E66, E77, E85, E99, & E110: Quantities for Grooving Bridge Deck were added.

Sheets E54 & E87: FALSEWORK note was revised.

Sheets E55 & E88: BRIDGE DECK GROOVING note was added.

Sheet F2: PCN 01QS
Bid Item 380E6505 "NGCS Grinding PCC Pavement" was added
Bid Item 380E6510 "Grinding PCC Pavement" was added

PCN 020Q
Bid Item 380E6505 "NGCS Grinding PCC Pavement" was added
Bid Item 380E6510 "Grinding PCC Pavement" was added

Sheet F6: 13", 12", 11.5" MAINLINE, 8" SHOULDER NONREINFORCED
CONCRETE PAVEMENT and 11" CONTINUOUSLY REINFORCED PCC
PAVEMENT notes were updated.

Sheet F7: TINING note was revised and CONCRETE CORING FOR PAVEMENT
THICKNESS note was added.

Sheet F7a: NGCS GRINDING PCC PAVEMENT note and tables were added.

Sheets F48a – F48l: NGCS Grinding PCCP Layouts were added.

Sheet S2: PCN 01QS
Bid Item 632E3105 "Extruded Aluminum Sign, Removable Copy
Super/Very High Intensity" was added
Bid Item 632E3103 "Extruded Aluminum Sign, Removable Copy High
Intensity" was removed

Sincerely,

Sam Weisgram
Engineering Supervisor

SW/cj

CC: Craig Smith, Mitchell Region Engineer
Travis Dressen, Sioux Falls Area Engineer

REV. 11/15/15

SPECIAL PROVISIONS

PROJECT NUMBER(S): IM 0293(96)73, IM 2292(90)0 PCN: 01QS, 020Q

TYPE OF WORK: GRADING, STRUCTURES, PCC SURFACING, LIGHTING & UTILITIES

COUNTIES: LINCOLN, MINNEHAHA

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.

Greg Johnson is the official in charge of the Sioux Falls Career Center for Lincoln, Minnehaha Counties.

THE FOLLOWING ITEMS ARE INCLUDED IN THIS PROPOSAL FORM:

Special Provision for Contact Time, dated 11/6/15.

Special Provision for Subletting of Contract, dated 11/5/15.

Special Provision for Prosecution and Progress, dated 1/20/15.

Special Provision for On-The-Job Training Program, dated 7/10/12.

Special Provision Regarding Section 404 of the Clean water Act, dated 2/10/15.

Fact Sheet #23.

Special Provision for Stainless Reinforcing Steel, dated 11/5/15.

Special Provision for Contractor Staking with Machine Grading Option, dated 11/5/15.

Special Provision for Durable Pavement Markings, dated 10/28/15.

**Special Provision for Contractor Furnished Mix Designs for
PCC Pavement, dated 6/19/15.**

Special Provision for IRI PCC Pavement Smoothness, dated 9/8/15.

Special Provision for Concrete Penetrating Sealer, dated 2/22/10.

**Special Provision for Next Generation Concrete Surface (NGCS)
Grinding of PCC Pavement, dated 11/6/15.**

Special Provision for Shear Connector Field Installation, dated 12/22/10.

List of Utilities.

Special Provision for Contractor Administered Preconstruction Meeting, dated 4/18/13.

Fuel Adjustment Affidavit, DOT form 208 dated 7/15.

Standard Title VI Assurance, dated 7/14/08.

Special Provision For Disadvantaged Business Enterprise, dated 5/20/15.

Special Provision For EEO Affirmative Action Requirements on Federal and Federal-aid
Construction Contracts, dated 9/1/97.

Special Provision For Required Contract Provisions Federal-aid Construction Contracts, Form
FHWA 1273 (Rev. May/1/12), dated 4/30/13.

Required Contract Provisions Federal-aid Construction Contracts, Form
FHWA 1273 (Rev. 5/1/12).

Special Provision Regarding Minimum Wage on Federal-Aid Projects, dated 4/30/13.

Wage and Hour Division US Department of Labor Washington DC.

- US Dept. of Labor Decision Number SD150001, dated 10/9/15.

Special Provision for Price Schedule for Miscellaneous Items, dated 8/3/15.

Special Provision Regarding Storm Water Discharge, dated 5/3/13.

General Permit for Storm Water Discharges Associated with Construction

Activities, dated 2/1/10. <http://denr.sd.gov/des/sw/Permits/ConstructionGeneralPermit2010.pdf>

* * * *

**STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION**

**SPECIAL PROVISION
FOR
CONTRACT TIME**

**PROJECT IM 0293(96)73 & IM 2292(90)0; PCN 01QS & 020Q
LINCOLN & MINNEHAHA COUNTIES**

NOVEMBER 25, 2015

April 4, 2106 Work Restriction

The Contractor will not begin work on the project prior to April 4, 2016 unless approved by the Engineer.

Removal of Structure on SB I-29 (Str. No. 42-066-006) Closure Requirement

The Contractor will complete the removal of the structure on SB I-29, Str. No. 42-066-006, within 2 nights. For the 2 night closure requirement, the Contractor may close Ramps C and G from the hours of 8:00 PM to 5:00 AM only.

If the Contractor does not open Ramps C and G within the timeframe specified, the Department will make a disincentive assessment amounting to \$2,000 per hour.

Setting Girders on the New SB I-29 Structure Closure Requirement

The Contractor will complete the setting of the girders for the new SB I-29 structure within 4 nights. For the 4 night closure requirement, the Contractor may close Ramps C and G from the hours of 8:00 PM to 5:00 AM only.

If the Contractor does not open Ramps C and G within the timeframe specified, the Department will make a disincentive assessment amounting to \$2,000 per hour.

Removal of Falsework on the New SB I-29 Structure Closure Requirement

The Contractor will complete the removal of falsework on new SB I-29 structure within 1 night. For the 1 night closure requirement, the Contractor may close Ramps C and G from the hours of 10:00 PM to 5:00 AM only.

If the Contractor does not open Ramps C and G within the timeframe specified, the Department will make a disincentive assessment amounting to \$2,000 per hour.

Removal of Temporary Structure on I-29 Closure Requirement

The Contractor will complete the removal of the temporary structure on I-29 within 1 night. For the 1 night closure requirement, the Contractor may close Ramps C and G from the hours of 8:00 PM to 5:00 AM only.

If the Contractor does not complete the work within the completion requirement, the Department will make a disincentive assessment amounting to \$2,000 per hour.

Removal of Structure on NB I-29 (Str. No. 42-067-006) Closure Requirement

The Contractor will complete the removal of the structure on NB I-29, Str. No. 42-067-006, within 2 nights. For the 2 night closure requirement, the Contractor may close Ramps C and G from the hours of 8:00 PM to 5:00 AM only.

If the Contractor does not open Ramps C and G within the timeframe specified, the Department will make a disincentive assessment amounting to \$2,000 per hour.

Setting Girders on the New NB I-29 Structure Closure Requirement

The Contractor will complete the setting of the girders for the new NB I-29 structure within 4 nights. For the 4 night closure requirement, the Contractor may close Ramps C and G from the hours of 8:00 PM to 5:00 AM only.

If the Contractor does not open Ramps C and G within the timeframe specified, the Department will make a disincentive assessment amounting to \$2,000 per hour.

Removal of Falsework on the New NB I-29 Structure Closure Requirement

The Contractor will complete the removal of falsework on new NB I-29 structure within 1 night. For the 1 night closure requirement, the Contractor may close Ramps C and G from the hours of 10:00 PM to 5:00 AM only.

If the Contractor does not open Ramps C and G within the timeframe specified, the Department will make a disincentive assessment amounting to \$2,000 per hour.

Installation of Sign Bridge Requirement

The Contractor will complete the installation of any sign bridge over live traffic from the hours of 12:00 AM to 6:00 AM only.

Substantial Completion

The Contractor will substantially complete the project by the November 4, 2016 substantial completion date.

The Department will consider the work substantially complete when all lanes are opened to unimpeded traffic and all of the following work is completed:

Grading, storm sewer, surfacing, permanent signing, roadway lighting, temporary or permanent pavement markings, and temporary or permanent erosion control measures in place.

The Engineer, in his or her sole discretion will determine when the project is substantially complete.

Following the substantial completion of the project, the Department will allow single lane closures for the completion of the remaining items of work (including, but not limited to, temporary ramp detour removal, Next Generation Concrete Surface (NGCS) grinding, permanent pavement marking, and seeding and mulching). The Department will allow single lane closures during daylight hours only and only when the Contractor is actively performing work. Daylight hours will be defined as sunrise to sunset.

The Department wants to accelerate the project by offering an incentive to the Contractor. The Department will make an incentive payment in the amount of \$10,000 per calendar day to the contract for each calendar day the Contractor substantially completes the work prior to the required substantial completion requirement. The Department will make a disincentive assessment in the amount of \$10,000 per calendar day to the contract for each calendar day the work is not completed beyond required substantial completion requirement. The Department will count calendar days in accordance with Section 8.6 B.

The maximum incentive for this portion of the project is limited to \$300,000. There is no maximum disincentive.

NGCS Grinding and Mainline Grooving and Placing Durable Pavement Markings Work Restriction

In areas of the project where there are only two lanes of traffic, the Department will not allow the Contractor to work between the hours of 6:00 AM and 9:00 AM and 4:00 PM and 6:00 PM.

In areas of the project where there are more than two lanes of traffic, the Contractor will maintain two lanes of traffic between the hours of 6:00 AM and 9:00 AM and 4:00 PM and 6:00 PM.

Ramp NGCS Grinding and Grooving and Placing Durable Pavement Markings Work Restriction

The Contractor will complete the NGCS grinding and grooving and placing durable pavement markings work on all ramps half width at a time. The Contractor will not be allowed to work on the ramps between the hours of 6:00 AM and 9:00 AM and 4:00 PM and 6:00 PM.

Str. No. 42-064-030 and Str. No. 42-065-030 Completion Requirement

The Contractor will not begin work on Str. No. 42-064-030 or Str. No. 42-065-030 prior to April 3, 2017 unless approved by the Engineer.

SB Driving Lane of Str. No. 42-064-030 Completion Requirement

In addition, the Contractor will complete all work in the SB driving lane of Str. No. 42-064-030 within 25 working days. The Department will charge workings days on all working days the Contractor closes the SB driving lane to through traffic. The Department will count working days in accordance with Section 8.6 A.

If the Contractor does not complete the work within the working day completion requirement, the Department will make a disincentive assessment in the amount of \$3,000 per working day. The Department will count working days in accordance with Section 8.6 A.

SB Passing Lane of Str. No. 42-064-030 Completion Requirement

In addition, the Contractor will complete all work in the SB passing lane of Str. No. 42-064-030 within 25 working days. The Department will charge workings days on all working days the Contractor closes the SB passing lane to through traffic. The Department will count working days in accordance with Section 8.6 A.

If the Contractor does not complete the work within the working day completion requirement, the Department will make a disincentive assessment in the amount of \$3,000 per working day. The Department will count working days in accordance with Section 8.6 A.

NB Driving Lane of Str. No. 42-065-030 Completion Requirement

In addition, the Contractor will complete all work in the NB driving lane of Str. No. 42-065-030 within 25 working days. The Department will charge workings days on all working days the Contractor closes the NB driving lane to through traffic. The Department will count working days in accordance with Section 8.6 A.

If the Contractor does not complete the work within the working day completion requirement, the Department will make a disincentive assessment in the amount of \$3,000 per working day. The Department will count working days in accordance with Section 8.6 A.

NB Passing Lane of Str. No. 42-065-030 Completion Requirement

In addition, the Contractor will complete all work in the NB passing lane of Str. No. 42-065-030 within 25 working days. The Department will charge working days on all working days the Contractor closes the NB passing lane to through traffic. The Department will count working days in accordance with Section 8.6 A.

If the Contractor does not complete the work within the working day completion requirement, the Department will make a disincentive assessment in the amount of \$3,000 per working day. The Department will count working days in accordance with Section 8.6 A.

Field Work Completion

The Contractor will complete the project by the August 1, 2017 field work completion date.

Time Extensions

In order to avoid or reduce liquidated damages and disincentive assessments or to increase incentive payments, the Contractor may request a time extension for the structure closure requirements, substantial completion requirement, and field work completion requirement. The Department will consider these time extension requests using the same considerations that apply when granting an extension of contract time under Section 8.7, except extra work or an increase in quantities will not qualify for an automatic extension of time based on a proportional increase in the contract amount.

Failure to Complete on Time

The Contractor will substantially complete the project prior to the substantial completion requirement or the substantial completion requirement as amended by formally approved time extensions. If the Contractor does not complete the work by the substantial completion requirement or the substantial completion requirement as amended by formally approved time, the Department will assess liquidated damages in accordance with Section 8.8 Table A in addition to the disincentive assessment for substantial completion. The Department will assess liquidated damages for each working day the work (project) is late until the Contractor substantially completes the work.

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

The Contractor will complete all work on the project prior to the field work completion requirement or the field work completion requirement as amended by formally approved time extensions. If the Contractor does not complete all work by the field work completion requirement or the field work completion requirement as amended by formally approved time extensions, 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. This table depicts the typical number of adverse weather days expected for any given month, based on historical records. The Department will consider this project a grading project in Zone 6.

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 structure closure requirements, substantial completion requirement, and field work completion requirement 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

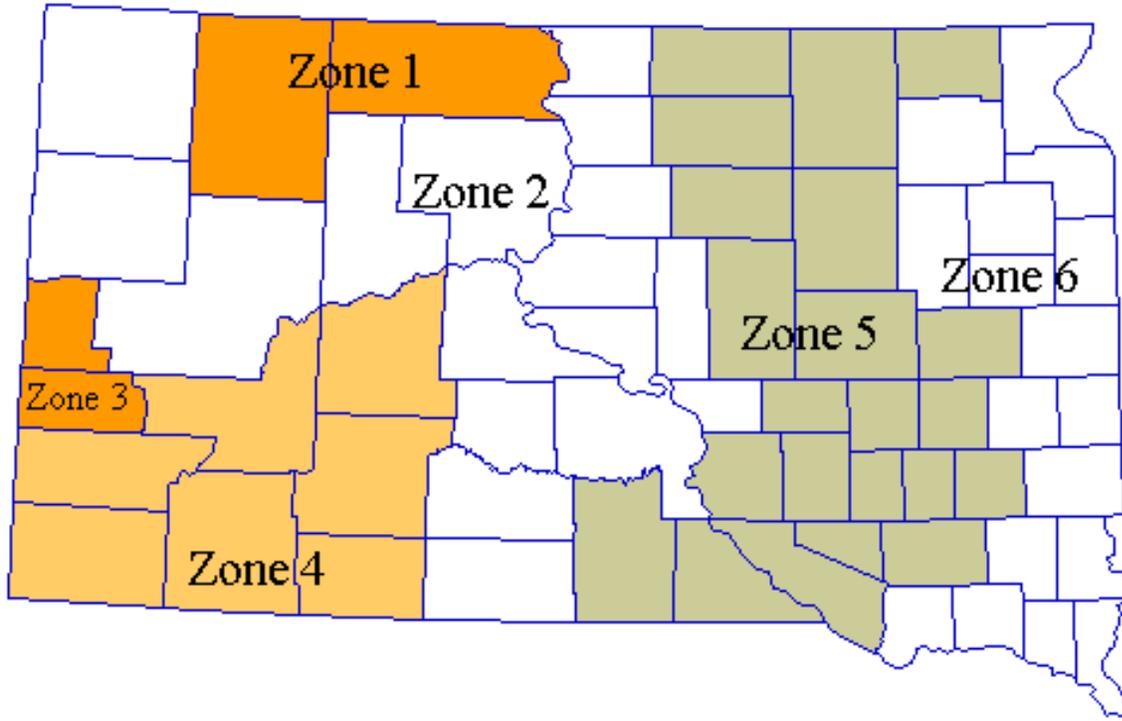


Table 1 - Expected Adverse Weather Days for South Dakota

	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.

**STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION**

**SPECIAL PROVISION
FOR
NEXT GENERATION CONCRETE SURFACE (NGCS)
GRINDING OF PCC PAVEMENT**

**PROJECT IM 0293(96)73 & IM 2292(90)0; PCN 01QS & 020Q
LINCOLN & MINNEHAHA COUNTIES**

NOVEMBER 24, 2015

I. DESCRIPTION

This work consists of creating a Next Generation Concrete Surface (NGCS) on new or existing concrete pavement through grinding and grooving techniques to provide a quiet surface meeting the specified smoothness requirements.

II. MATERIALS (None Required)

III. CONSTRUCTION REQUIREMENTS

A. NGCS Grinding:

1. **Equipment:** NGCS grinding of PCC pavement shall be accomplished using diamond blades mounted on a self-propelled machine designed specifically for diamond grinding and texturing pavement. The equipment shall weigh a minimum of 35,000 pounds including the grinding head and be of a size that will grind a strip at least 4 feet wide in a single pass. The effective wheel base of the machine shall be no less than 12 feet. The effective wheel base is defined as the distance from the front wheel assembly transverse pivot point to the transverse pivot point of the profile/depth control/ground drive wheels.

The equipment shall be such that it will not strain or damage the underlying pavement surface. Grinding equipment that causes raveling, aggregate fractures, spalls, or disturbance to the transverse or longitudinal joints shall not be permitted. The equipment shall have positive means of vacuuming the grinding residue from the pavement surface leaving the surface in a clean, near-dry condition.

The Contractor shall maintain the equipment to ensure the equipment is in proper working order, with attention paid to the “roundness” of the match and depth control wheels. The Contractor shall immediately replace any wheels found to be out of round.

- 2. Construction:** The Contractor shall schedule and proceed with construction operations in a manner that produces a neat, uniform finished surface. Shoulder grinding shall transition from the edge of the mainline and other lanes requiring NGCS grinding as required to provide drainage, leaving no more than a 3/16 inch ridge and an acceptable riding surface. Adequate cross slope drainage shall be maintained. The Contractor shall use NGCS grinding or conventional diamond grinding in accordance with Section 380.3 O when conditions require a feather pass into adjacent surfacing outside of the area requiring NGCS grinding. For concrete repair projects, full and partial depth concrete repairs, slab stabilization, and dowel bar retrofit shall be completed prior to any grinding. For projects with new concrete pavement, the Contractor shall not begin the NGCS grinding until the concrete has attained a compressive strength of 4,000 psi. Joint sealing shall be completed subsequent to the diamond grinding operations. Structures shall not be ground.

NGCS construction may be accomplished as a single-pass or two-pass operation as determined by the Contractor. If the Contractor elects to use a single pass operation, PCC pavement smoothness requirements stated later in this special provision must be attained and checked periodically by the Contractor throughout the construction phase to ensure corrective grinding is not necessary as this could impact the quality of the NGCS texture.

Grinding shall be accomplished in a manner that eliminates joint or crack faults so there is no more than a 1/16 inch differential between the adjacent sides of the joints and cracks.

Lateral drainage shall be achieved by maintaining a constant cross slope between grinding extremities in each lane. The finished cross slope shall mirror the pre-grind cross slope and shall have no depressions or misalignment of slope greater than 1/8 inch in 10 feet when measured with a 10 foot straightedge placed perpendicular to the centerline. Straightedge requirements will not apply across longitudinal joints or outside the ground area.

The grinding shall be performed in a longitudinal direction. Grinding shall begin and end at lines normal to the pavement centerline at the project limits. Passes of the grinding head shall not overlap more than 1 inch. No

unground surface area between passes will be permitted. The area ground shall not be left smooth or polished.

a. Single-Pass NGCS Operation: The construction operation will provide a flush ground surface that contains longitudinal grooves and shall be constructed in one, single-pass operation. The diamond blade stack will consist of two types of diamond grinding blades arranged to provide a flush ground surface as well as those required to produce the longitudinal grooves. The diamond blade stack shall be mounted on a 4 foot grinding head, stacked with 0.125 inch wide blades separated by 0.035 +/- 0.005 inch wide spacers. The blades used to produce the flush ground surface shall be flat across their contact surface and in the same plane with other flush grind blades (excluding grooving blades) when mounted. The complete head, when stacked with all blades, shall be straight across its length without bowing when mounted on the diamond grinding machine. No unground surface area between passes will be permitted. The longitudinal grooving blades will be spaced among the flush grind blade stack on 1/2 inch to 5/8 inch centers and shall produce grooves 1/8 inch to 3/16 inch in depth. The grooves shall be constructed parallel to the centerline. The contractor shall use a guide to ensure proper alignment of the grooves to centerline.

b. Two-Pass NGCS Operation: This construction operation will allow for two separate operations to construct the NGCS section. The first operation will create the flush ground surface. The flush grind blades shall be mounted on a 4 foot grinding head, stacked with 0.125 inch wide blades separated by 0.035 +/-0.005 inch wide spacers. The blades used to produce the flush ground surface shall be flat across their contact surface and in the same plane with other flush grind blades when mounted. The complete head, when stacked with all blades, shall be straight across its length without bowing when mounted on the diamond grinding machine. No unground surface area between passes will be permitted. The PCC pavement smoothness requirements stated within this special provision must be attained and measured to the satisfaction of the Engineer prior to constructing the second operation. The second operation will provide the longitudinal grooves. The longitudinal grooves shall be 1/8 inch wide and will be 1/8 inch to 3/16 inch in depth. The longitudinal grooves will be spaced on 1/2 inch to 5/8 inch centers. The grooves shall be constructed parallel to the centerline. The contractor shall use a guide to ensure proper alignment of the grooves to centerline.

3. Final Surface Finish: The NGCS grinding process shall produce a pavement surface that is true to grade and uniform in appearance with a longitudinal grooved texture. The flush ground surface shall appear

smooth and shall contain no ridges that exceed 1/32 inch. The longitudinal grooves shall be constructed parallel to the centerline. At a minimum, 98% of the pavement surface shall be textured utilizing the NGCS. Depressed pavement areas due to subsidence, edge slump or other localized causes will be excluded from this requirement when approved by the Engineer.

- 4. Slurry Handling:** The Contractor shall establish a positive means for the removal of the grinding and grooving residue. Solid residue shall be removed from the pavement surfaces before being blown by traffic action or wind. Residue shall not be permitted to flow across lanes used by public traffic. Residue shall be disposed of in a manner that will prevent residue, whether in solid or slurry form, from reaching any waterway in a concentrated state. Residue may continuously flow on adjacent dry vegetated roadway slopes or ditches within the right-of-way. A flexible drag hose shall be attached to the discharge end of the slurry pipe to minimize splashing of slurry placed on roadway slopes or ditches. If the Engineer determines that the slurry is going to enter a waterway, drainage facility, or curb & gutter section, the slurry shall be placed in storage tanks and deposited in settling basins, spread over flat vegetated areas, or filtered by other means approved by the Engineer at no additional cost.

The Contractor shall satisfactorily remove grinding material or wastes prior to returning traffic to the roadway. If a significant amount of residue remains after grinding, the Engineer may require flushing be done in a manner and in sufficient quantity to assure that slurry produced by the pavement grinding is not deposited on vehicles. The Contractor's proposed method of flushing the roadway should produce acceptable results, which will be based on a driving surface that will not create a nuisance for the public. All costs for flushing roadway shall be incidental to the contract unit price per square yard for Grinding PCC Pavement.

- 5. IRI Pavement Smoothness:** The Contractor may perform quality control profile testing as needed to control the work. The Contractor assumes all responsibility for the finished product meeting the pavement smoothness requirements. The Department will perform IRI pavement smoothness acceptance testing following the completion of the NGCS grinding, conventional grinding, and joint sealing in accordance with the Special Provision for IRI PCC Pavement Smoothness except as modified by the following:

Delete the 2nd paragraph of Section C and replace with the following:

The Department will collect the profile data after the Contractor completes all PCC paving required for profiling following completion of the NGCS grinding and joint sealing. If the NGCS grinding and joint sealing is completed in phases, the Department may IRI acceptance profile test a completed phase before the completion of subsequent phases. Phases

are defined as plan designated portions of the project at least 0.3 miles in length, or other portions as approved by the Engineer, that will be utilized by the traveling public during completion of subsequent phases of the project. The Contractor's chosen sequence of operations, if applicable, or the Contractor's option to complete a portion of a phase will not require the Department to perform IRI acceptance profile testing prior to the completion of work (phase of project or overall project).

Add the following condition to the list of conditions in Section C.1:

- The Contractor has completed all NGCS grinding in the area to be IRI acceptance profile tested;

Delete Table 1 and replace with the following:

Table 1. ALR Monetary Deductions and Corrective Grinding Requirements	
25 ft. Continuous MRI (Inches per mile)	Corrective Grinding or Monetary Deduction
125.0 or less	Acceptable
125.1 or greater	Corrective Grinding as required by the Engineer

Delete the paragraph immediately below Table 1.

Delete Section C.2 and replace with the following:

Corrective Grinding: The Contractor will accomplish corrective grinding with specially prepared circular diamond blades mounted on a horizontal shaft meeting the requirements for the NGCS grinding or conventional diamond grinding in accordance with Section 380.3 O. The Contractor will day light corrective grinding to the outside edge of the pavement. The Contractor will repair and replace joint sealant damaged by corrective grinding as directed by the Engineer and at no additional cost to the Department. The Contractor will not leave ground areas smooth or polished. The Contractor will perform NGCS grinding following the corrective grinding or as part of the corrective grinding. The Contractor will ensure ground areas have a uniform texture equal in roughness to the surrounding pavement with NGCS grinding completed. Following the completion of corrective grinding, the Department will re-profile test ALR.

Delete Table 2 and replace with the following:

Table 2. IRI Pay Scale	
IRI	Price Adjustment
Inches per mile	(Dollars per lot)
35.0 or less	\$900
35.1 to 40.0	\$700
40.1 to 45.0	\$500
45.1 to 60.0	\$0
60.1 or greater	Corrective Grinding*

*Lots with an average IRI of 60.1 inches per mile or greater will require grinding to an average IRI of less than 60.1 inches per mile and will receive 100.0% pay. This will require that the lot be reprofiled by the Department

Delete the last paragraph of Section E and replace with the following:

The Contractor will provide all temporary traffic control required for IRI smoothness testing and marking of any corrective grinding areas. The Department will measure and pay for all temporary traffic control required for conducting the smoothness testing and associated work in accordance with Section 634 as part of the overall project.

IV. METHOD OF MEASUREMENT

- A. NGCS Grinding PCC Pavement:** The Engineer will measure NGCS grinding PCC pavement for the construction of the NGCS by the square yard. The measurement will be the final textured surface area regardless of the number of passes required to achieve acceptable results. Minor areas of unground pavement within the designated areas to be ground will be included in the measurement.
- B. Grinding PCC Pavement:** The Engineer will measure grinding PCC pavement for the feather pass, if required, by the square yard based on a width of 2 feet multiplied by the length in feet of the required feather pass.

V. BASIS OF PAYMENT

- A. NGCS Grinding PCC Pavement:** NGCS grinding PCC pavement will be paid for at the contract unit price per square yard. Payment shall be full compensation for equipment, labor, incidentals necessary for grinding the pavement, removing residue and excess water, hauling and disposal of grinding slurry, and the Contractor quality control profile testing.

B. Grinding PCC Pavement: Grinding PCC pavement will be paid for at the contract unit price per square yard. Payment shall be full compensation for equipment, labor, incidentals necessary for grinding the pavement, removing residue and excess water, and hauling and disposal of grinding slurry.

* * * * *

ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

Grading – Section B (020Q)

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
009E3230	Grade Staking	2.745	Mile
009E3240	Graded Centerline Staking	1.141	Mile
009E3245	Final Cross Section Survey	1.141	Mile
009E3250	Miscellaneous Staking	1.141	Mile
009E3280	Slope Staking	1.141	Mile
009E3300	Three Man Survey Crew	40.0	Hour
100E0100	Clearing	Lump Sum	LS
110E0400	Remove Drop Inlet	1	Each
110E0600	Remove Fence	5,025	Ft
110E0700	Remove 3 Cable Guardrail	330	Ft
110E0730	Remove Beam Guardrail	180.0	Ft
110E0740	Remove 3 Cable Guardrail Anchor Assembly	2	Each
110E1100	Remove Concrete Pavement	16,923.0	SqYd
120E0010	Unclassified Excavation	90,257	CuYd
120E0400	Select Subgrade Topping	30,335	CuYd
120E1000	Muck Excavation	3,230	CuYd
120E6100	Water for Embankment	581.1	MGal
* 270E0040	Salvage and Stockpile Asphalt Mix and Granular Base Material	4,752.1	Ton
270E0040	Salvage and Stockpile Asphalt Mix and Granular Base Material	6,813.1	Ton
450E0122	18" RCP Class 2, Furnish	16	Ft
450E0130	18" RCP, Install	16	Ft
450E2304	18" RCP Safety End, Furnish	1	Each
450E2307	18" RCP Safety End, Install	1	Each
462E0100	Class M6 Concrete	0.8	CuYd
480E0100	Reinforcing Steel	108	Lb
621E0160	6' Chain Link Fence with Tension Wired Top	5,025	Ft
629E0110	NCHRP 350 Test Level 3 High Tension Cable Guardrail	2,212	Ft
629E0290	NCHRP 350 Test Level 3 High Tension Cable Guardrail Anchor Assembly	10	Each
670E2200	Type C Frame and Grate	1	Each

* - Denotes Non-Participating

Traffic Control – Section C (01QS)

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E4600	Salvage Traffic Control Barrier End Protection	4	Each
250E0010	Incidental Work	Lump Sum	LS
320E1200	Asphalt Concrete Composite	200.0	Ton
628E1200	Haul Movable Concrete Barrier	284	Each
634E0010	Flagging	400.0	Hour
634E0110	Traffic Control Signs	1,178	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0280	Type 3 Barricade, 8' Single Sided	19	Each
634E0340	Temporary Raised Pavement Markers	5,680	Mile
634E0420	Type C Advance Warning Arrow Board	1	Each
634E0525	Linear Delineation System Panel, Barrier Mounted	2,217	Each
634E0560	Remove Pavement Marking, 4" or Equivalent	55,672	Ft
634E0640	Temporary Pavement Marking	196,256	Ft
634E0750	Temporary Concrete Barrier End Protection	6	Each
634E0760	Temporary Concrete Barrier End Protection Module Set or Repair Kit	2	Each
634E1215	Contractor Furnished Portable Changeable Message Sign	3	Each
634E3000	Traffic Control Barrier	3,000	Ft
634E3010	Traffic Control Barrier - State Furnished	3,200	Ft
634E3020	Traffic Control Barrier - Rental	5,650	Ft
634E3030	Reset Traffic Control Barrier	13,175	Ft
634E3100	Reset Traffic Control Barrier End Protection	4	Each

Traffic Control – Section C (020Q)

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
250E0010	Incidental Work	Lump Sum	LS
634E0010	Flagging	200.0	Hour
634E0110	Traffic Control Signs	415	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0280	Type 3 Barricade, 8' Single Sided	10	Each
634E0340	Temporary Raised Pavement Markers	1,520	Mile
634E0420	Type C Advance Warning Arrow Board	1	Each
634E0560	Remove Pavement Marking, 4" or Equivalent	32,789	Ft
634E0640	Temporary Pavement Marking	17,952	Ft
634E1215	Contractor Furnished Portable Changeable Message Sign	4	Each

Erosion and Sediment Control – Section D (01QS)

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E1690	Remove Sediment	10.3	CuYd
110E1693	Remove Erosion Control Wattle	1,125	Ft
110E1700	Remove Silt Fence	3,688	Ft
230E0010	Placing Topsoil	37,438	CuYd
730E0212	Type G Permanent Seed Mixture	2,120	Lb
731E0200	Fertilizing	40.80	Ton
732E0100	Mulching	163.0	Ton
734E0044	Soil Stabilizer	35.0	Acre
734E0103	Type 3 Erosion Control Blanket	20,440	SqYd
734E0131	Type 1 Turf Reinforcement Mat	2,800.0	SqYd
734E0154	12" Diameter Erosion Control Wattle	3,650	Ft
734E0160	20" Diameter Erosion Control Wattle	850	Ft
734E0165	Remove and Reset Erosion Control Wattle	1,125	Ft
734E0510	Shaping for Erosion Control Blanket	8,705	Ft
734E0602	Low Flow Silt Fence	14,750	Ft
734E0610	Mucking Silt Fence	1,024	CuYd
734E0620	Repair Silt Fence	3,688	Ft
734E0845	Sediment Control at Inlet with Frame and Grate	8	Each
735E1120	2' Deciduous Shrub, Furnish and Plant	302	Each
735E2020	2' to 4' Tree, Furnish and Plant	51	Each
735E2040	4' to 6' Tree, Furnish and Plant	100	Each
900E1320	Construction Entrance	4	Each

Erosion and Sediment Control – Section D (020Q)

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E1690	Remove Sediment	1.0	CuYd
110E1693	Remove Erosion Control Wattle	80	Ft
110E1700	Remove Silt Fence	253	Ft
230E0010	Placing Topsoil	6,528	CuYd
730E0212	Type G Permanent Seed Mixture	390	Lb
731E0200	Fertilizing	7.50	Ton
732E0100	Mulching	30.0	Ton
734E0044	Soil Stabilizer	6.0	Acre
734E0154	12" Diameter Erosion Control Wattle	300	Ft
734E0160	20" Diameter Erosion Control Wattle	30	Ft
734E0165	Remove and Reset Erosion Control Wattle	80	Ft
734E0602	Low Flow Silt Fence	1,010	Ft
734E0610	Mucking Silt Fence	70	CuYd
734E0620	Repair Silt Fence	253	Ft

ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM0293(96)73/IM2292(90)0	A3	A8

Plotting Date: 11/25/2015 Revised: 11/25/2015 (MRK)

Structure – Section E (01QS)

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E3470	Salvage Large Block Retaining Wall	555	SqFt
250E0030	Incidental Work, Structure	Lump Sum	LS
380E2431	Concrete Barrier and 8' Plain Jointed Concrete Shoulder	180	Ft
380E2451	Concrete Barrier and 10' Plain Jointed Concrete Shoulder	190	Ft
410E0030	Structural Steel, Miscellaneous	Lump Sum	LS
410E4002	Salvage and Relocate Bridge	Lump Sum	LS
460E0070	Class A45 Concrete, Bridge Repair	0.2	CuYd
460E0300	Breakout Structural Concrete	0.2	CuYd
632E0072	4' Diameter Fixed Support Concrete Footing	413.0	Ft
632E0074	4.5' Diameter Fixed Support Concrete Footing	20.0	Ft
635E5040	4' Diameter Footing	352.0	Ft
650E2000	Concrete Barrier Curb and Gutter	328	Ft
650E2001	Concrete Barrier Curb and Gutter End Section	26	Ft

Structure 42-065-030 – Section E (01QS)

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E0010	Remove Concrete Bridge Approach Slab	233.2	SqYd
410E2600	Membrane Sealant Expansion Joint	87.1	Ft
460E0070	Class A45 Concrete, Bridge Repair	3.8	CuYd
460E0150	Concrete Approach Slab for Bridge	186.3	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	68.1	SqYd
460E0172	Concrete Patching Material, Bridge Deck	24.0	CuFt
460E0380	Install Dowel in Concrete	110	Each
480E0200	Epoxy Coated Reinforcing Steel	274	Lb
480E0504	No. 4 Rebar Splice	28	Each
480E0505	No. 5 Rebar Splice	52	Each
480E0506	No. 6 Rebar Splice	44	Each
491E0007	Two Coat Bridge Deck Polymer High Friction Chip Seal	920.0	SqYd
491E0110	Abrasive Blasting of Bridge Deck	920.0	SqYd
491E0120	Bridge Deck Grinding	920.0	SqYd
491E0130	Concrete Removal, Class A	4.0	SqYd
491E0140	Concrete Removal, Class B	4.0	SqYd
734E2020	Bridge Berm Slope Protection, Crushed Aggregate	211.2	SqYd

Structure 42-066-006 – Section E (01QS)

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E3310	Bridge Elevation Survey	Lump Sum	LS
009E5000	Concrete Penetrating Sealer	1,884.0	SqYd
260E1010	Base Course	3,222.0	Ton
410E0020	Structural Steel	Lump Sum	LS
410E2600	Membrane Sealant Expansion Joint	115.8	Ft
411E0100	Bridge Painting	Lump Sum	LS
420E0100	Structure Excavation, Bridge	212	CuYd
430E0200	Bridge End Embankment	1,662	CuYd
430E0300	Granular Bridge End Backfill	113.0	CuYd
460E0030	Class A45 Concrete, Bridge Deck	510.4	CuYd
460E0050	Class A45 Concrete, Bridge	515.4	CuYd
460E0150	Concrete Approach Slab for Bridge	432.2	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	93.2	SqYd
460E0215	Grooving Bridge Deck	2,245.4	SqYd
480E0100	Reinforcing Steel	66,633	Lb
480E0507	No. 7 Rebar Splice	150	Each
480E0514	No. 14 Rebar Splice	66	Each
510E0300	Preboring Pile	260	Ft
510E3521	HP 14x73 Steel Test Pile, Furnish and Drive	330	Ft
510E3525	HP 14x73 Steel Bearing Pile, Furnish and Drive	8,285	Ft
680E0040	4" Underdrain Pipe	186	Ft
680E2500	Porous Backfill	32.8	Ton
734E2020	Bridge Berm Slope Protection, Crushed Aggregate	1,028.6	SqYd
831E1010	Geogrid Reinforcement	3,559	SqYd

Structure 42-064-030 – Section E (01QS)

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E0010	Remove Concrete Bridge Approach Slab	233.2	SqYd
410E2600	Membrane Sealant Expansion Joint	87.1	Ft
460E0070	Class A45 Concrete, Bridge Repair	3.8	CuYd
460E0150	Concrete Approach Slab for Bridge	186.3	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	68.1	SqYd
460E0172	Concrete Patching Material, Bridge Deck	24.0	CuFt
460E0380	Install Dowel in Concrete	110	Each
480E0200	Epoxy Coated Reinforcing Steel	274	Lb
480E0504	No. 4 Rebar Splice	28	Each
480E0505	No. 5 Rebar Splice	52	Each
480E0506	No. 6 Rebar Splice	44	Each
491E0007	Two Coat Bridge Deck Polymer High Friction Chip Seal	920.0	SqYd
491E0110	Abrasive Blasting of Bridge Deck	920.0	SqYd
491E0120	Bridge Deck Grinding	920.0	SqYd
491E0130	Concrete Removal, Class A	4.0	SqYd
491E0140	Concrete Removal, Class B	4.0	SqYd
734E2020	Bridge Berm Slope Protection, Crushed Aggregate	211.2	SqYd

Structure 42-066-006 – Alternate A (01QS)

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
480E0300	Stainless Reinforcing Steel	137,967	Lb

Structure 42-066-006 – Alternate B (01QS)

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
480E0250	Zinc and Epoxy Dual-Coated Reinforcing Steel	137,967	Lb

ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

Structure 42-067-006 – Section E (01QS)

Revised 11/25/2015 (KSV)

Surfacing – Section F (01QS)

Surfacing – Section F (020Q)

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E3310	Bridge Elevation Survey	Lump Sum	LS
009E5000	Concrete Penetrating Sealer	1,541.0	SqYd
260E1010	Base Course	2,584.0	Ton
410E0020	Structural Steel	Lump Sum	LS
410E2600	Membrane Sealant Expansion Joint	91.8	Ft
411E0100	Bridge Painting	Lump Sum	LS
420E0100	Structure Excavation, Bridge	198	CuYd
430E0200	Bridge End Embankment	1,723	CuYd
430E0300	Granular Bridge End Backfill	85.8	CuYd
460E0030	Class A45 Concrete, Bridge Deck	435.0	CuYd
460E0050	Class A45 Concrete, Bridge	347.9	CuYd
460E0150	Concrete Approach Slab for Bridge	310.0	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	73.9	SqYd
460E0215	Grooving Bridge Deck	1,768.5	SqYd
480E0100	Reinforcing Steel	44,019	Lb
480E0507	No. 7 Rebar Splice	118	Each
480E0514	No. 14 Rebar Splice	48	Each
510E0300	Preboring Pile	220	Ft
510E3521	HP 14x73 Steel Test Pile, Furnish and Drive	330	Ft
510E3525	HP 14x73 Steel Bearing Pile, Furnish and Drive	5,955	Ft
680E0040	4" Underdrain Pipe	156	Ft
680E2500	Porous Backfill	28.6	Ton
734E2020	Bridge Berm Slope Protection, Crushed Aggregate	926.5	SqYd
831E1010	Geogrid Reinforcement	2,598	SqYd

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E1020	Remove Asphalt Concrete Pavement	4,499.6	CuYd
110E1640	Remove Granular Material	3,240.9	CuYd
120E6200	Water for Granular Material	1,413.3	MGal
120E9000	Pit Run	7,978.0	Ton
260E1010	Base Course	2,497.2	Ton
260E1030	Base Course, Salvaged	14,432.8	Ton
260E2010	Gravel Cushion	13,718.9	Ton
260E2030	Gravel Cushion, Salvaged	79,288.3	Ton
320E0007	PG 64-28 Asphalt Binder	496.1	Ton
320E1060	Class G Asphalt Concrete	8,783.0	Ton
320E3000	Compaction Sample	3	Each
320E4000	Hydrated Lime	86.7	Ton
330E0010	MC-70 Asphalt for Prime	0.6	Ton
330E0100	SS-1h or CSS-1h Asphalt for Tack	10.4	Ton
330E0210	SS-1h or CSS-1h Asphalt for Flush Seal	3.6	Ton
330E2000	Sand for Flush Seal	65.8	Ton
380E0120	11.5" Nonreinforced PCC Pavement	1,000.0	SqYd
380E0130	12" Nonreinforced PCC Pavement	36,213.6	SqYd
380E0150	13" Nonreinforced PCC Pavement	101,177.2	SqYd
380E0560	11" Continuously Reinforced PCC Pavement	72.0	SqYd
380E0800	PCC Shoulder Pavement	56,500.8	SqYd
380E6000	Dowel Bar	58,409	Each
380E6110	Insert Steel Bar in PCC Pavement	2,258	Each
380E6505	NGCS Grinding PCC Pavement	123,995.9	SqYd
380E6510	Grinding PCC Pavement	8,830.3	SqYd
410E2600	Membrane Sealant Expansion Joint	493.2	Ft
680E0100	Cutoff Drain	2	Each
831E0210	Non-woven Geotextile Separator	3,459	SqYd

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E1020	Remove Asphalt Concrete Pavement	984.2	CuYd
120E6200	Water for Granular Material	218.5	MGal
260E1010	Base Course	3,014.2	Ton
260E1030	Base Course, Salvaged	240.6	Ton
260E2010	Gravel Cushion	2,205.4	Ton
260E2030	Gravel Cushion, Salvaged	12,745.9	Ton
320E0007	PG 64-28 Asphalt Binder	106.6	Ton
320E1060	Class G Asphalt Concrete	1,886.4	Ton
320E3000	Compaction Sample	3	Each
320E4000	Hydrated Lime	18.6	Ton
330E0010	MC-70 Asphalt for Prime	0.5	Ton
330E0100	SS-1h or CSS-1h Asphalt for Tack	2.3	Ton
330E0210	SS-1h or CSS-1h Asphalt for Flush Seal	1.0	Ton
330E2000	Sand for Flush Seal	17.5	Ton
380E0130	12" Nonreinforced PCC Pavement	25,594.9	SqYd
380E0800	PCC Shoulder Pavement	8,853.3	SqYd
380E6000	Dowel Bar	11,227	Each
380E6110	Insert Steel Bar in PCC Pavement	72	Each
380E6505	NGCS Grinding PCC Pavement	19,871.0	SqYd
380E6510	Grinding PCC Pavement	1,452.4	SqYd

Structure 42-067-006 – Alternate A (01QS)

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
480E0300	Stainless Reinforcing Steel	114,998	Lb

Structure 42-067-006 – Alternate B (01QS)

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
480E0250	Zinc and Epoxy Dual-Coated Reinforcing Steel	114,998	Lb

ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM0293(96)73/IM2292(90)0	A5	A8

Plotting Date: 11/25/2015 Revised: 11/25/2015 (MRK)

Signal and Lighting – Section L (01QS)

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
635E0050	Breakaway Base Luminaire Pole with Arm, 50' Mounting Height	11	Each
635E0350	Breakaway Base Luminaire Pole with Top Twin Mount, 50' Mounting Height	40	Each
635E3150	150' Light Tower with Lowering Device	12	Each
635E3230	Roadway Luminaire, 1000 Watt	62	Each
635E3340	Roadway Luminaire, 400 Watt with Photoelectric Cell	11	Each
635E3384	Post Top Luminaire, 400 Watt with Photoelectric Cell	80	Each
635E3515	Under Bridge Deck Luminaire, 100 Watt	6	Each
635E5020	2' Diameter Footing	408.0	Ft
635E5302	Type 2 Electrical Junction Box	33	Each
635E5360	Surface Mounted Junction Box	6	Each
635E5400	Electrical Service Cabinet	6	Each
635E5500	Meter Socket	6	Each
635E8020	2" Rigid Galvanized Steel Conduit	180	Ft
635E8120	2" Rigid Conduit, Schedule 40	26,517	Ft
635E8220	2" Rigid Conduit, Schedule 80	3,050	Ft
635E8230	3" Rigid Conduit, Schedule 80	380	Ft
635E8310	1" Innerduct, Schedule 40	11,855	Ft
635E9011	1/C #1 AWG Copper Wire	5,615	Ft
635E9012	1/C #2 AWG Copper Wire	37,571	Ft
635E9014	1/C #4 AWG Copper Wire	8,720	Ft
635E9016	1/C #6 AWG Copper Wire	3,320	Ft
635E9020	1/C #10 AWG Copper Wire	12,515	Ft
635E9710	2/C #10 AWG Copper Pole and Bracket Cable	5,915	Ft
635E9826	6 Pair Communication Cable	340	Ft
900E2030	Miscellaneous Work	1	Site

Signal and Lighting – Section L (020Q)

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
635E3150	150' Light Tower with Lowering Device	5	Each
635E3230	Roadway Luminaire, 1000 Watt	18	Each
635E5302	Type 2 Electrical Junction Box	2	Each
635E5400	Electrical Service Cabinet	1	Each
635E5500	Meter Socket	1	Each
635E8120	2" Rigid Conduit, Schedule 40	3,485	Ft
635E8220	2" Rigid Conduit, Schedule 80	250	Ft
635E9011	1/C #1 AWG Copper Wire	10,695	Ft
635E9016	1/C #6 AWG Copper Wire	650	Ft

Pavement Marking – Section M (01QS)

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
633E1300	Pavement Marking Paint, White	415	Gal
633E1305	Pavement Marking Paint, Yellow	200	Gal
633E3000	Durable Pavement Marking, 4" White	60,647	Ft
633E3005	Durable Pavement Marking, 4" Yellow	47,988	Ft
633E3010	Durable Pavement Marking, 8" White	1,875	Ft
633E3020	Durable Pavement Marking, 12" White	11,223	Ft
633E3030	Durable Pavement Marking, 24" White	233	Ft
633E3055	Durable Pavement Marking, Lane Reduction Arrow	2	Each
633E5100	Grooving for Durable Pavement Marking, 4"	108,636	Ft
633E5105	Grooving for Durable Pavement Marking, 8"	1,875	Ft
633E5110	Grooving for Durable Pavement Marking, 12"	11,223	Ft
633E5115	Grooving for Durable Pavement Marking, 24"	233	Ft
633E5131	Grooving for Durable Pavement Marking, Lane Reduction Arrow	2	Each

Pavement Marking – Section M (020Q)

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
633E1300	Pavement Marking Paint, White	52	Gal
633E1305	Pavement Marking Paint, Yellow	24	Gal
633E3000	Durable Pavement Marking, 4" White	6,612	Ft
633E3005	Durable Pavement Marking, 4" Yellow	5,523	Ft
633E3010	Durable Pavement Marking, 8" White	643	Ft
633E3020	Durable Pavement Marking, 12" White	1,520	Ft
633E5100	Grooving for Durable Pavement Marking, 4"	12,135	Ft
633E5105	Grooving for Durable Pavement Marking, 8"	643	Ft
633E5110	Grooving for Durable Pavement Marking, 12"	1,520	Ft

Permanent Signing – Section S (01QS)

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E0120	Remove Sign Bridge	3	Each
110E0130	Remove Traffic Sign	81	Each
110E7150	Remove Sign for Reset	7	Each
250E0010	Incidental Work	Lump Sum	LS
632E0010	1.25' Diameter Breakaway Support Concrete Footing	84.0	Ft
632E0012	1.5' Diameter Breakaway Support Concrete Footing	8.0	Ft
632E0014	1.75' Diameter Breakaway Support Concrete Footing	164.0	Ft
632E0058	2.25' Diameter Fixed Support Concrete Footing	102.0	Ft
632E0060	2.5' Diameter Fixed Support Concrete Footing	24.0	Ft
632E1225	W6x12 Steel Post	54.0	Ft
632E1235	W6x20 Steel Post	129.7	Ft
632E1240	W8x18 Steel Post	38.2	Ft
632E1245	W8x21 Steel Post	229.9	Ft
632E1255	W8x28 Steel Post	134.4	Ft
632E1260	W8x31 Steel Post	47.2	Ft
632E1320	2.0"x2.0" Perforated Tube Post	241.9	Ft
632E1410	3" Diameter Steel Post, .216" Shell	38.1	Ft
632E1415	4" Diameter Steel Post, .237" Shell	248.4	Ft
632E2000	4"x4" Amber Delineator with 1.12 Lb/Ft Post	144	Each
632E2004	4"x8" Amber Delineator with 1.12 Lb/Ft Post	15	Each
632E2020	4"x4" White Delineator with 1.12 Lb/Ft Post	193	Each
632E2024	4"x8" White Delineator with 1.12 Lb/Ft Post	37	Each
632E2220	Guardrail Delineator	18	Each
632E2520	Type 2 Object Marker	15	Each
632E3105	Extruded Aluminum Sign, Removable Copy Super/Very High Intensity	5,190.8	SqFt
632E3203	Flat Aluminum Sign, Nonremovable Copy High Intensity	239.0	SqFt
632E3205	Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity	321.0	SqFt
632E3500	Reset Sign	7	Each
632E5010	Double Beam Sign Bridge	5	Each
632E5020	Overhead Cantilever Sign Support	3	Each
635E5302	Type 2 Electrical Junction Box	3	Each
635E8120	2" Rigid Conduit, Schedule 40	1,000	Ft
635E8220	2" Rigid Conduit, Schedule 80	75	Ft
635E9020	1/C #10 AWG Copper Wire	3,538	Ft

SECTION B ESTIMATE OF QUANTITIES

Revised: 11/25/2015 (MRK)

01QS

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
004E0050	Remove Traffic Diversion(s)	Lump Sum	LS
009E0010	Mobilization	Lump Sum	LS
009E3230	Grade Staking	16.679	Mile
009E3240	Graded Centerline Staking	7.136	Mile
009E3245	Final Cross Section Survey	7.508	Mile
009E3250	Miscellaneous Staking	7.508	Mile
009E3280	Slope Staking	7.508	Mile
009E3290	Structure Staking	2	Each
009E3300	Three Man Survey Crew	160	Hour
100E0100	Clearing	Lump Sum	LS
110E0400	Remove Drop Inlet	9	Each
110E0500	Remove Pipe Culvert	300	Ft
110E0600	Remove Fence	24,697	Ft
110E0650	Remove Crossover Closure	371	Ft
110E0655	Remove Interim Crossover Closure	448	Ft
110E0700	Remove 3 Cable Guardrail	3,893	Ft
110E0730	Remove Beam Guardrail	785	Ft
110E0740	Remove 3 Cable Guardrail Anchor Assembly	21	Each
110E0770	Remove W Beam Guardrail Breakaway Cable Terminal	3	Each
110E1100	Remove Concrete Pavement	107,960	SqYd
110E6010	Remove 3 Cable Guardrail Anchor Assembly for Reset	4	Each
110E7510	Remove Pipe End Section for Reset	3	Each
120E0010	Unclassified Excavation	395,804	CuYd
120E0400	Select Subgrade Topping	167,077	CuYd
120E0500	Option Borrow Excavation	52,741	CuYd
120E1000	Muck Excavation	27,170	CuYd
120E6100	Water for Embankment	2,553.1	MGal
240E0010	Obliterate Old Road	20	Sta
250E0020	Incidental Work, Grading	Lump Sum	LS
270E0040	Salvage and Stockpile Asphalt Mix and Granular Base Material	99,894.5	Ton
* 270E0040	Salvage and Stockpile Asphalt Mix and Granular Base Material	69,676.2	Ton
270E0110	Salvage and Stockpile Granular Material	3,305.7	Ton
421E0100	Pipe Culvert Undercut	108	CuYd
450E0102	12" RCP Class 2, Furnish	176	Ft
450E0110	12" RCP, Install	176	Ft
450E0142	24" RCP Class 2, Furnish	362	Ft
450E0150	24" RCP, Install	362	Ft
450E0162	30" RCP Class 2, Furnish	528	Ft
450E0170	30" RCP, Install	528	Ft
450E0182	36" RCP Class 2, Furnish	8	Ft
450E0190	36" RCP, Install	8	Ft
450E0242	72" RCP Class 2, Furnish	16	Ft
450E0250	72" RCP, Install	16	Ft
450E2016	24" RCP Flared End, Furnish	4	Each
450E2017	24" RCP Flared End, Install	4	Each
450E2024	30" RCP Flared End, Furnish	8	Each
450E2025	30" RCP Flared End, Install	8	Each
450E2200	24" RCP Sloped End, Furnish	3	Each
450E2201	24" RCP Sloped End, Install	3	Each
450E2304	18" RCP Safety End, Furnish	1	Each
450E2307	18" RCP Safety End, Install	1	Each
450E3012	24" RCP Arch Class 2, Furnish	106	Ft
450E3020	24" RCP Arch, Install	106	Ft
450E3072	60" RCP Arch Class 2, Furnish	200	Ft
450E3080	60" RCP Arch, Install	200	Ft

450E4528	60" RCP Arch Flared End, Furnish	4	Each
450E4529	60" RCP Arch Flared End, Install	4	Each
450E4600	24" RCP Arch Sloped End, Furnish	1	Each
450E4601	24" RCP Arch Sloped End, Install	1	Each
450E4739	12" CMP 16 Gauge, Furnish	434	Ft
450E4740	12" CMP, Install	434	Ft
450E4758	18" CMP 14 Gauge, Furnish	48	Ft
450E4760	18" CMP, Install	48	Ft
450E5203	12" CMP Flared End, Furnish	4	Each
450E5204	12" CMP Flared End, Install	4	Each
450E5211	18" CMP Flared End, Furnish	2	Each
450E5212	18" CMP Flared End, Install	2	Each
450E9001	Reset Pipe End Section	3	Each
462E0100	Class M6 Concrete	16.1	CuYd
464E0100	Controlled Density Fill	4.5	CuYd
480E0100	Reinforcing Steel	1,496	Lb
600E0300	Type III Field Laboratory	1	Each
620E0030	Type 3 Right-of-Way Fence	9,176	Ft
620E1020	2 Post Panel	14	Each
620E1030	3 Post Panel	6	Each
621E0160	6' Chain Link Fence with Tension Wired Top	15,521	Ft
629E0100	3 Cable Guardrail	2,395	Ft
629E0110	NCHRP 350 Test Level 3 High Tension Cable Guardrail	6,200	Ft
629E0290	NCHRP 350 Test Level 3 High Tension Cable Guardrail Anchor Assembly	30	Ft
629E0300	3 Cable Guardrail Slip Base Anchor Assembly	8	Each
629E0400	3 Cable Guardrail Anchor Assembly	4	Each
629E0410	Reset 3 Cable Guardrail Anchor Assembly	4	Each
* 629E1107	Furnish High Tension Cable Guardrail Post	50	Each
* 629E1109	Furnish High Tension Cable Guardrail Post and Sleeve	50	Each
* 629E8010	Cable Tension Indicator	1	Each
629E9000	Crossover Closure	608	Ft
630E0110	Straight Double Class A Thrie Beam Guardrail with Wood Posts	75	Ft
630E1010	Straight Class A W Beam Guardrail with Wood Posts	225	Ft
630E2000	W Beam to Thrie Beam Guardrail Transition	6	Each
630E2030	W Beam Guardrail Breakaway Cable Terminal	6	Each
650E4380	Type D48 Concrete Curb and Gutter	106	Ft
670E2200	Type C Frame and Grate	1	Each
670E3200	Type D Frame and Grate	8	Each
670E4205	Type M Frame and Grate Assembly	2	Each
670E5400	Precast Drop Inlet Collar	8	Each
671E7010	Adjust Manhole	1	Each
720E1015	Bank and Channel Protection Gabion	18.0	CuYd

020Q

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
009E3230	Grade Staking	2.745	Mile
009E3240	Graded Centerline Staking	1.141	Mile
009E3245	Final Cross Section Survey	1.141	Mile
009E3250	Miscellaneous Staking	1.141	Mile
009E3280	Slope Staking	1.141	Mile
009E3300	Three Man Survey Crew	40	Hour
100E0100	Clearing	Lump Sum	LS
110E0400	Remove Drop Inlet	1	Each
110E0600	Remove Fence	5,025	Ft
110E0700	Remove 3 Cable Guardrail	330	Ft
110E0730	Remove Beam Guardrail	180	Ft
110E0740	Remove 3 Cable Guardrail Anchor Assembly	2	Each

110E1100	Remove Concrete Pavement	16,923	SqYd
120E0010	Unclassified Excavation	90,257	CuYd
120E0400	Select Subgrade Topping	30,335	CuYd
120E1000	Muck Excavation	3,230	CuYd
120E6100	Water for Embankment	581.1	MGal
270E0040	Salvage and Stockpile Asphalt Mix and Granular Base Material	6,813.1	Ton
270E0040	Salvage and Stockpile Asphalt Mix and Granular Base Material	4,752.1	Ton
450E0122	18" RCP Class 2, Furnish	16	Ft
450E0129	18" RCP, Install	16	Ft
450E2304	18" RCP Safety End, Furnish	1	Each
450E2307	18" RCP Safety End, Install	1	Each
462E0100	Class M6 Concrete	0.8	CuYd
480E0100	Reinforcing Steel	108	Lb
621E0160	6' Chain Link Fence with Tension Wired Top	5,025	Ft
629E0110	NCHRP 350 Test Level 3 High Tension Cable Guardrail	2,212	Ft
629E0290	NCHRP 350 Test Level 3 High Tension Cable Guardrail Anchor Assembly	10	Ft
670E2200	Type C Frame and Grate	1	Each

* Denotes Non- Participating

GRADING OPERATIONS

Water for Embankment is estimated at the rate of 10 gallons of water per cubic yard of Embankment minus Waste.

The estimated cubic yards of excavation and/or embankment required to construct outlet ditches, ditch blocks, and approaches are included in the earthwork balance notes on the profile sheets.

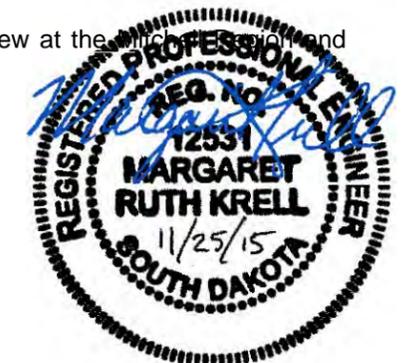
Special ditch grades and other sections of the roadway different than the typical sections shall be constructed to the limits shown on the cross sections. If significant changes to the cross sections are necessary during construction, the Engineer shall contact the Designer for the proposed change.

Generally, all shallow inlet and outlet ditches as noted on the plan sheets shall be cut with a 10-foot wide bottom with 5:1 backslopes. However, the Engineer may direct the Contractor to adjust the ditch width for proper alignment with the drainage structure.

Temporary fence and/or permanent fence shall be placed ahead of the grading operation unless otherwise directed by the Engineer.

On superelevated curves the grade referred to on the profile is the centerline grade elevation prior to calculating superelevation.

A copy of the soils profile is available for review at the Mitchell, SD and Sioux Falls Area offices.



PROCEDURES FOR DETERMINING UNCLASSIFIED EXCAVATION QUANTITY

When plan quantities are used for payment, the Unclassified Excavation quantity shall be used for final payment.

The following paragraphs are general earthwork information and information in regards to computing the Unclassified Excavation quantity when final cross sections are taken in the field:

The Unstable Material Excavation quantity is included in the Excavation quantity listed in the Table of Unclassified Excavation. When finaling a project, the Unstable Material Excavation quantity shall be added to the Excavation quantity to compute the Unclassified Excavation quantity.

Out-of-Balance Excavation is material obtained from waste generated from excavation from other balances. The quantity of Out-of-Balance Excavation is included in the Excavation quantity in the balance where it is excavated and is paid for once as Unclassified Excavation.

The Topsoil quantity in the Table of Unclassified Excavation is an estimate. When finaling the project, the total quantity of field measured Topsoil shall be used in place of the estimated Topsoil quantity. The quantity of Topsoil from the cuts will be paid for twice as Unclassified Excavation, as it will be in both the Excavation and Topsoil quantities. This will be full compensation for Excavation, which includes necessary undercutting to provide space for placement of topsoil. The estimated quantity of 2,900 cubic yards of topsoil located in the DOT Maintenance Yard in the northwest quadrant of Tallgrass Avenue and 69th Street shall be used for this project (01QS) at no additional cost to the project.

The Excavation quantities from individual balances and the Table of Unclassified Excavation have been reduced by the volume of in place surfacing that will be removed and/or salvaged.

As shown in the Table of Unclassified Excavation (above and in Section F), the estimated quantity of 104,491 cubic yards of Salvaged Asphalt Mix and Granular Base Material from fill sections shall be added to the Excavation quantity to determine the Unclassified Excavation quantity. When finaling a project, the quantities of Salvaged Asphalt Mix and Granular Base Material from fill sections and off-alignment roadways or obliterated old roads will not be adjusted according to field measurements. The quantity of Salvaged Asphalt Mix and Granular Base Material from cut sections will not be added to the Excavation quantity as it is already in the cuts on the final cross sections.

The volume of in place Concrete Surfacing removed will NOT be paid for as Unclassified Excavation.

The Excavation quantities from individual balances and the table above have been reduced by the volume of in place concrete pavement that will be removed.

When finaling the project, the estimated quantity of 30,911 cubic yards of Concrete Pavement removed from the cut sections shall be subtracted from the Unclassified Excavation quantity for final payment. The quantity of Concrete Pavement from cut sections subtracted from the Unclassified Excavation quantity shall be plans quantity and will not be adjusted according to field measurements.

TABLE OF OPTION BORROW EXCAVATION

	(CuYd)
Option Borrow Excavation	47,841
Topsoil in Option Borrow Pits	4,900
Total:	52,741

HAUL

Included in the Table of Excavation Quantities by Balances are Dead Haul, Option Borrow Haul, Out-of-Balance Haul, and Haul. They are not pay items and are for informational purposes only.

Dead Haul: Estimated quantity (CuYdSta) for moving option borrow excavation material from the option borrow site to the centerline mainline station listed in the Table of Borrow Locations in Earthwork Balance.

Option Borrow Haul: Estimated quantity (CuYdSta) for moving option borrow excavation material from the centerline mainline station listed in the Table of Borrow Locations in Earthwork Balance to the locations where it is needed throughout the earthwork balance.

Out-of-Balance Haul: Estimated quantity (CuYdSta) for moving material from an earthwork balance to another earthwork balance.

Haul: Estimated quantity (CuYdSta) for moving unclassified excavation material to the locations where it is needed throughout the earthwork balance.

For Purpose of Extra Haul Computations:

$$\text{Average Haul} = (\text{Haul} + \text{Out-of-Balance Haul}) / \text{Unclassified Excavation} = (695,839 + 761,507) / 180,216 = 8.0 \text{ Sta.}$$

$$\text{Average Option Borrow Haul} = (\text{Option Borrow Haul} + \text{Dead Haul}) / \text{Total Option Borrow Excavation} = (197,795 + 2,958,005) / 47,841 = 66.0 \text{ Sta.}$$

UNDERCUTTING FOR SELECT SUBGRADE TOPPING

After the existing PCCP and asphalt is removed, the existing gravel cushion/ base course shall be removed and stockpiled. The removed PCCP will be crushed to a minus 2.5 inch size.

In all cut sections, the subgrade will be undercut to a depth of 1.5 feet. The undercut area will be scarified to a depth of 6 inches and re-compacted by the Specified Density Method. The crushed PCCP and the salvaged gravel cushion/ base course will be blended with the soil taken from the undercut and used as Select Subgrade Topping to backfill the undercut. The blended backfill material will consist of a mix of approximately 60% undercut soil and 40% salvaged surfacing and gravel cushion/ base course.

In fill sections, the top 1.5 feet of subgrade will be constructed with the Select Subgrade Topping. To obtain the Select Subgrade Topping, the salvaged PCCP and granular material will be mixed with new embankment material at the same 60/40 rate as the undercut backfill. Shallow embankment sections, i.e. fills less than 1.5 feet in height measure at the finished subgrade shoulder, will be undercut to ensure the upper 1.5 of subgrade is constructed with Select Subgrade Topping.



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM0293(96)73/IM2292(90)0	B5	B128

Revised: 11/25/2015 (MRK)

Payment to remove the undercut shall be paid for once as Unclassified Excavation.

All cost associated with the crushing, mixing and placement of the Select Subgrade Topping material shall be included in the contract unit price per cubic yard for Select Subgrade Topping.

Select Subgrade Topping shall be compacted with sheepsfoot or other approved rollers. Compaction shall be as per 260.3.D. Additional test strips will be made as required by changes in soil types. Moisture requirements will be determined in accordance with SD 104, except the optimum and field moisture will be determined using material passing a ¾ inch sieve. Density testing will be performed a minimum of 1 per half mile per lift. Moisture testing will be performed a minimum of 1 per day.

WASTE

Waste material that is not used as out-of-balance excavation is estimated to be 77,630 cubic yards and shall be stockpiled in the infield area between Ramps C and G as directed by the engineer at no additional cost to the project.

UNSTABLE MATERIAL EXCAVATION

The areas of unstable material excavation are drawn on the cross sections with a normal depth of 2 feet. The estimated quantity of 4,637 cubic yards of unstable material excavation shall be paid for at the contract unit price per cubic yard for "Unclassified Excavation".

All areas designated as Unstable shall be excavated. The unstable material excavated on this project shall be placed outside the subgrade shoulder in fill sections or stockpiled and used as topsoil.

Field measurement of unstable material excavation shall not be made. However, if there are additional areas of unstable material excavation other than what is shown in the plans, the Engineer shall direct removal of these areas and the additional areas will be measured according to the Engineer.

TABLE OF UNSTABLE MATERIAL EXCAVATION

Station to	Station	L/R	Depth (Ft)	Quantity (CuYd)
122+00	125+00	L	2	558
21+34	26+00 (Ramp B)	R	2	494
27+00	35+00 (Ramp G)	R	2	206
39+50	43+00 (Ramp G)	R	2	3,004
01QS Subtotal:				4,262
16+00	19+00	L	2	375
020Q Subtotal:				375
Project Total:				4,637

PIT INFORMATION SHEET BORROW Sheet 1 OF 2

STATE OF SOUTH DAKOTA	PROJECT IM 0293(96)73 IM 2292(90)0	SHEET B15	TOTAL SHEETS B128
-----------------------	--	--------------	----------------------

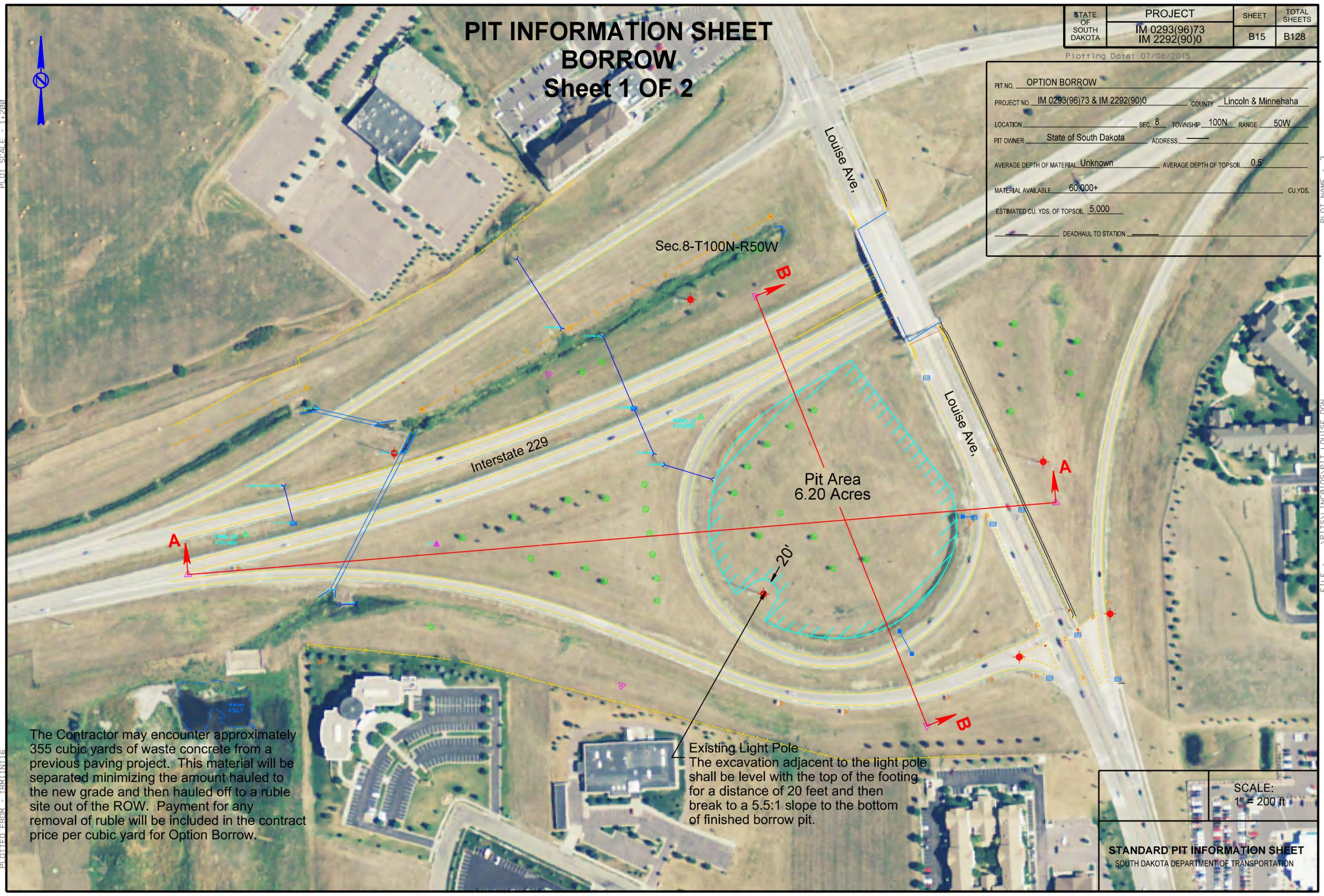
Plotting Date: 07/08/2015

PIT NO. <u>OPTION BORROW</u>	
PROJECT NO. <u>IM 0293(96)73 & IM 2292(90)0</u>	COUNTY <u>Lincoln & Minnehaha</u>
LOCATION _____	SEC. <u>8</u> TOWNSHIP <u>100N</u> RANGE <u>50W</u>
PIT OWNER <u>State of South Dakota</u>	ADDRESS _____
AVERAGE DEPTH OF MATERIAL <u>Unknown</u>	AVERAGE DEPTH OF TOPSOIL <u>0.5'</u>
MATERIAL AVAILABLE <u>60,000+</u>	CU.YDS.
ESTIMATED CU. YDS. OF TOPSOIL <u>5,000</u>	
DEADHAUL TO STATION _____	

PLOT SCALE - 1:2000

PLOT NAME - 3

FILE - ... \PITS\LINCOLN\SPIT1\LOUISE.DGN



The Contractor may encounter approximately 355 cubic yards of waste concrete from a previous paving project. This material will be separated minimizing the amount hauled to the new grade and then hauled off to a rubble site out of the ROW. Payment for any removal of rubble will be included in the contract price per cubic yard for Option Borrow.

Existing Light Pole
The excavation adjacent to the light pole shall be level with the top of the footing for a distance of 20 feet and then break to a 5.5:1 slope to the bottom of finished borrow pit.

	SCALE: 1" = 200 ft
--	-----------------------

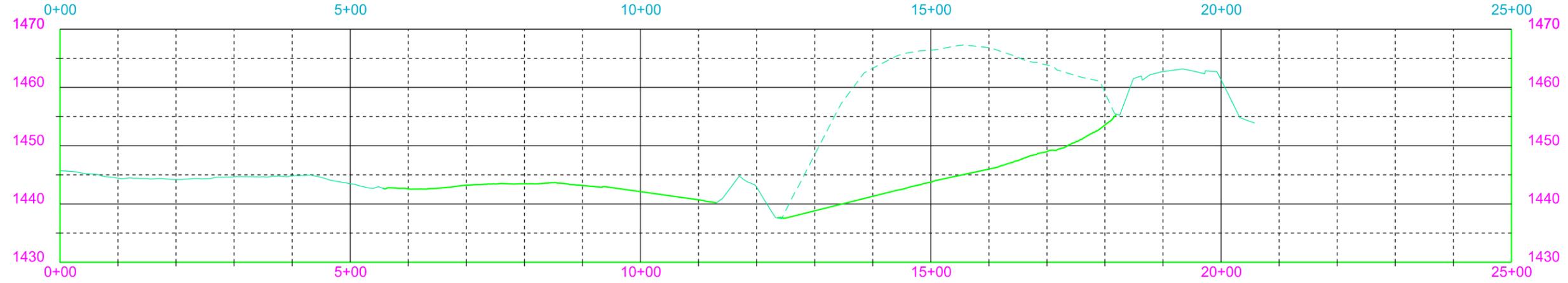
STANDARD PIT INFORMATION SHEET
SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION

PIT INFORMATION SHEET BORROW Sheet 2 OF 2

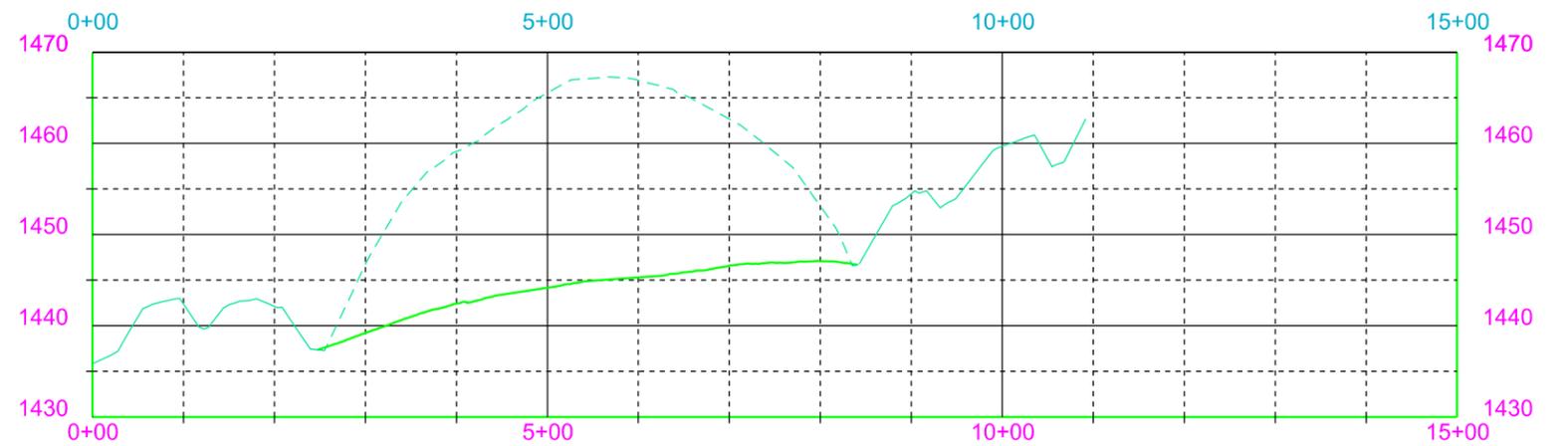
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0293(96)73 IM 2292(90)0	B16	B128

Plotting Date: 07/08/2015

SECTION A-A



SECTION B-B



PLOT SCALE - 1:200

PLOTTED FROM - IRWIN16

PLOT NAME - 4

FILE - ... \PITS\INC\0105\PIT16.LOUISE.DGN

SECTION C ESTIMATE OF QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT IM 0292(96)073/IM 2292(90)0	SHEET C2	TOTAL SHEETS C40
-----------------------	--	-------------	---------------------

Revised: 11/25/2015 (MRK)

01QS

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E4600	Salvage Traffic Control Barrier End Protection	4	Each
250E0010	Incidental Work	Lump Sum	LS
320E1200	Asphalt Concrete Composite	200.0	Ton
628E1200	Haul Movable Concrete Barrier	284	Each
634E0010	Flagging	400	Hour
634E0110	Traffic Control Signs	1,178	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0280	Type 3 Barricade, 8' Single Sided	19	Each
634E0340	Temporary Raised Pavement Markers	5,680	Mile
634E0420	Type C Advance Warning Arrow Board	1	Each
634E0525	Linear Delineation System Panel, Barrier Mounted	2,217	Each
634E0560	Remove Pavement Marking, 4" or Equivalent	55,672	Feet
634E0640	Temporary Pavement Marking	196,256	Feet
634E0750	Temporary Concrete Barrier End Protection	6	Each
634E0760	Temporary Concrete Barrier End Protection Module Set or Repair Kit	2	Each
634E1215	Contractor Furnished Portable Changeable Message Sign	3	Each
634E3000	Traffic Control Barrier	3000	Ft
634E3010	Traffic Control Barrier - State Furnished	3200	Ft
634E3020	Traffic Control Barrier - Rental	5650	Ft
634E3030	Reset Traffic Control Barrier	13175	Ft
634E3040	Haul Traffic Control Barrier	2000	Ft
634E3100	Reset Traffic Control Barrier End Protection	4	Each

020Q

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
250E0010	Incidental Work	Lump Sum	LS
634E0010	Flagging	200	Hour
634E0110	Traffic Control Signs	415	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0280	Type 3 Barricade, 8' Single Sided	10	Each
634E0340	Raised Pavement Markers	1,520	Mile
634E0420	Type C Advance Warning Arrow Panel	1	Each
634E0560	Remove Pavement Marking, 4" or Equivalent	32,789	Feet
634E0640	Temporary Pavement Marking	17,952	Feet
634E1215	Contractor Furnished Portable Changeable Message Sign	4	Each

SEQUENCE OF OPERATIONS

The following Sequence of Operations shall be followed by the Contractor unless an alternate Sequence of Operations is submitted in writing two weeks prior to the preconstruction meeting and approved by the Engineer. The project shall be constructed in (4) phases according to the following Notes, Phasing Details, and Special Provisions.

PHASE I

I29 SB Shoulder Widening station 24+94 to station 43+50
I29 SB Mainline station 43+50 to 78+00, station 80+80 to 100+00, station 103+00 to 172+50.

1. Remove tubular markers and Install barrier on I29 NB for mainline head-to-head traffic control per the Traffic Control Layouts and Standard Plates. Removal of markers shall be incidental work.

2. The Contractor shall maintain (2) lanes of traffic in both directions (head-to-head) on I29 NB pavement during both the am peak hour (from 6:00 AM to 9:00 AM) and the pm peak hour (from 4:00 PM to 7:00 PM).
3. Entrance and Exit Ramps are to remain open utilizing the in-place temporary pavement constructed under Project No. IM 0292(78)073 PCN 0511 and per the Traffic Control Layouts and Standard Plates.
4. Ramp closures on Ramp C and Ramp G for I29 SB bridge construction shall be in accordance with the special provision for contract time and the Traffic Control Layout.
5. Complete removals, grading, pipe culvert installation, surfacing, overhead signing, I29 SB bridge construction, and lighting.

PHASE Ia

Ramp C station 8+75 to 42+00

1. Maintain (1) lane of traffic per the Traffic Control Layouts and Standard Plates.
2. Complete removals, grading, surfacing, signing, and pavement markings.

PHASE Ib

Ramp G station 10+00 to 38+00, station 39+60 to 49+00

1. Maintain traffic on existing Ramp G and Ramp C per the Traffic Control Layouts and Standard Plates.
2. Complete removals, grading, surfacing, pipe culvert installation, signing and pavement markings.
3. Construct temporary crossover between Ramp G and Ramp C.

PHASE Ic

I229 NB station 149+00 to 152+80, station 155+80 to 181+00

1. Maintain (2) lanes of traffic per the Traffic Control Layouts and Standard Plates.
2. Complete removals, temporary pavement, grading, surfacing, pipe culvert installation, signing and pavement markings.

PHASE Id

I229 SB from Ramp A gore to station 101+30

1. Maintain (2) lanes of traffic per the Traffic Control Layouts and Standard Plates. Ramp A to remain open to traffic at all times.
2. Complete removals, grading, surfacing, pipe culvert installation, signing and pavement markings.

PHASE II

I29 SB Mainline station 78+00 to 80+80, station 100+00 to 103+00

I29 NB Mainline station 107+00 to 109+80, station 134+65 to 137+60

1. Shift I29 SB traffic to I29 SB lanes and shift I29 NB traffic off of diversion/temporary bridge per the Traffic Control Layouts and Standard Plates.
2. The Contractor shall maintain (2) lanes of traffic in both directions on I29 SB & NB pavement during both the am peak hour (from 6:00 AM to 9:00 AM) and the pm peak hour (from 4:00 PM to 7:00 PM).
3. Complete removals, grading, surfacing.
4. Complete temporary median crossovers station 98+96 to 108+17 and station 136+24 to 145+73.

PHASE IIa

Ramp C station 38+50 to 42+00

1. Maintain (1) lane of traffic per the Traffic Control Layouts and Standard Plates.
2. Complete removals, grading, surfacing, and pavement markings.

PHASE IIb

Ramp G station 38+00 to 39+60

1. Remove temporary bridge and embankment material. Ramp closures on Ramp C and Ramp G for temporary bridge removal shall be in accordance with the special provision for contract time and the Traffic Control Layout.
2. Complete removals, grading, surfacing, and pavement markings.

PHASE IIc

I229 NB station 152+80 to 157+20

1. Maintain traffic per the Traffic Control Layouts and Standard Plates.
2. Complete removals, grading, surfacing, pipe culvert installation, signing and pavement markings.

PHASE IId

I229 SB station 65+00 to Ramp A gore

1. Maintain (1) lane of traffic per the Traffic Control Layouts and Standard Plates.
2. Complete removals, grading, surfacing, pipe culvert installation, signing and pavement markings.

PHASE III

I29 NB Mainline station 43+50 to 107+00, station 109+80 to 134+65, station 137+60 to 172+50

1. Install barrier on I29 SB for mainline head-to-head traffic control per the Traffic Control Layouts and Standard Plates.
2. The Contractor shall maintain (2) lanes of traffic in both directions (head-to-head) on I29 SB pavement during both the am peak hour (from 6:00 AM to 9:00 AM) and the pm peak hour (from 4:00 PM to 7:00 PM).
3. Entrance and Exit Ramps are to remain open per the Traffic Control Layouts and Standard Plates.
4. Ramp closures on Ramp C and Ramp G for I29 NB bridge construction shall be in accordance with the special provision for contract time and the Traffic Control Layout.
5. Complete removals, grading, pipe culvert installation, surfacing, overhead signing, I29 NB bridge construction, and lighting.



PHASE III (continued)

- **PHASE IIIa**
Ramp A Complete Full Width
 1. Maintain traffic on existing Ramp A alignment per the Traffic Control Layouts and Standard Plates.
 2. Complete removals, grading, surfacing, pipe culvert installation, signing and pavement markings.
 3. SDN Communications has existing buried fiber optic cable to relocate along new Control of Access fence for Ramp A realignment. Contractor to coordinate with SDN concerning SDN planned relocation and timing of existing Control of Access fence removal.
- **PHASE IIIb**
I 229 NB & SB Inside Lanes
 1. Maintain traffic per the Traffic Control Layouts and Standard Plates.
 2. Complete removals, NGCS grinding, grading, surfacing, pipe culvert installation, signing and pavement markings.

PHASE IV
Approach Slab Repairs at Tea Interchange

1. Install traffic control on I29 NB and SB per the Standard Plates.
2. Complete the repairs for the approach slabs as per the plan requirements.

SPECIAL CONDITIONS

1. During non-work hours a maximum 4" drop off and 4:1 slope must be maintained adjacent to the traveled roadway. No extra payment will be made for this work.
2. Damage to the shoulder surfacing, slopes or ditches due to the Contractor's operations shall be repaired by the Contractor, to the satisfaction of the Engineer, at no expense to the State. This includes routing of traffic onto the shoulders around the work zones.
3. During all phases of construction, a minimum of 11.0' lanes shall be maintained.

NIGHTTIME WORK REQUIREMENTS

During all Phases of construction, work spaces shall be lighted in accordance with NCHRP 476, Level II. Cost to meet these requirements shall be included in the contract lump sum price for Incidental Work.

TRAFFIC CONTROL PLAN SHEET LAYOUTS

The plan sheets provided as part of Section C are intended to be used in conjunction with all applicable Standard Plates. Any details provided as sheets in this section (e.g. taper lengths, advance signing details, and centerline delineation details) are intended to replace the details shown in the corresponding Standard Plates. All other details in the Standard Plates which are not in conflict with the plan sheets provided shall be as detailed in the Standard Plates.

GENERAL MAINTENANCE OF TRAFFIC

Traffic shall be maintained in accordance with Section 4.5 of the 2015 Specifications. Traffic control shall be installed in accordance with the Federal Manual on Uniform Traffic Control Devices (MUTCD), Traffic Control Layouts and the Standard Plates located herein.

Removing, relocating, covering, salvaging and resetting of existing traffic control devices, including delineation, shall be the responsibility of the Contractor. Cost for this work shall be incidental to the contract unit prices for the various items unless otherwise specified in the plans. Any delineators and signs damaged or lost shall be replaced by the Contractor at no cost to the State.

Indiscriminate driving and parking of vehicles within the right-of-way will not be permitted. Any damage to the vegetation, surfacing, embankment, delineators and existing signs resulting from such indiscriminate use shall be repaired and/or restored by the Contractor, at no expense to the State, and to the satisfaction of the Engineer.

The Contractor shall provide documentation that all breakaway sign supports comply with NCHRP Report 350 or MASH crash-worthy requirements. The Contractor shall provide installation details at the preconstruction meeting for all breakaway sign support assemblies.

MAINTENANCE OF TRAFFIC

A Type 3 Barricade shall be installed at the end of a lane closure taper as detailed in these plans during pavement widening work on the mainline. Additional Type III Barricades shall be installed facing traffic within the closed lane at a spacing of 1/4 mile.

Reduced speed limit signs for 55mph through the work zone shall be spaced at 1/4 mile intervals on I29 and I229 / Ramp C.

MAINTENANCE OF OF NB LANES, SHOULDERS AND I-29 DIVERSION

It is anticipated that patching will be required on the existing NB lanes, shoulders and I29 diversion. The contractor shall be responsible for maintaining the surface throughout the length and duration of the project.

Included in the Estimate of Quantities is 200 tons of Asphalt Concrete Composite for this work.

Cost for maintaining the mainline surface, shoulders and I29 diversion for the length and duration of the project shall be incidental to the contract unit price per ton for "Asphalt Concrete Composite".

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0292(96)073/IM 2292(90)0	C3	C40

Revised: 11/25/2015 (MRK)

ADVANCE CLOSURE NOTICE

1 week prior to starting work, (3) portable changeable message signs shall be installed (1 NB on I29, 1 SB on I29 & 1 SB on I229) notifying drivers of the upcoming construction. The Contractor shall program the portable changeable message signs with the following message:

I29/I229 ROAD WORK
STARTS (Date)

Prior to the setting of new girders over traffic lanes, and removal of the temporary bridge, the Contractor will install closures on Ramp C and Ramp G as well as (4) portable changeable message signs per the traffic control advance warning detail in section C. This closure is in accordance with the special provision for contract time.

INCIDENTS

An incident is an emergency road user occurrence, a natural disaster, or other unplanned event that effects or impedes the normal flow of traffic such as an accident, hazardous materials spill, or similar event.

The Contractor shall set up a meeting prior to start of work to plan and coordinate responses to an incident. The Contractor will invite Department of Transportation, the South Dakota Highway patrol, the City of Sioux Falls, Lincoln County, and Minnehaha County, and the local emergency response entities to the meeting. The Project Engineer will conduct the meeting.

The Contractor will assist to maintain traffic as required by these plan notes and as agreed to at the meeting.

The Contractor may be required to modify messages on portable changeable message signs or relocate portable changeable message signs. The Contractor may be asked to provide flaggers to direct or detour traffic. The Contractor should be prepared to relocate advance warning signs if determined to be necessary for a major traffic incident lasting for more than two hours. Ground mounted advance warning signs may be covered and additional portable warning signs provided.

No additional payment will be made for the modification of portable changeable message sign messages or the relocation of portable changeable message signs. Cost for flagging shall be paid at the contract unit price per Hour of Flagging. Cost for the relocation of an advanced warning sign due to an incident shall be 50% of the designated sign rate as per Section 634.5 Basis of Payment in the Specifications. Cost for additional signs shall be paid at the contract unit bid price per square foot for "Traffic Control Signs".



BARRIER MOUNTED LINEAR DELINEATION SYSTEM PANELS

A yellow linear delineation system panel shall be attached to each side of the barrier sections used on the left side of traffic lanes. A yellow or white linear delineation system panel shall be attached to the side of the barrier section exposed to traffic on the right side of the traffic lanes.. The linear delineation system shall be 34 inches long and 6 inches in height and be constructed of aluminum formed into a shape to provide retroreflective properties across a wide range of angles. It shall be sheeted with Super/Very High Intensity sheeting per ASTM D4956 Type XI. The Contractor shall furnish, install and maintain panels as follows:

- One panel along each concrete barrier section installed at the center of the barriers when measured along the length
- Four panels along each 50' ZoneGuard barrier section spaced at 12.5' center to center.

The panels shall be installed with the top of the panel 4 inches below the top of the barrier. Installation shall be as per the manufacturer's recommendation using stainless steel inserts and bolts. This will allow for easy removal for replacement of damaged panels or replacement with an alternate color. Damaged linear delineation system panels shall be furnished and replaced by the Contractor. Cost for furnishing, installing and maintaining the linear delineation system panels shall be paid for at the contract unit price per each for "Linear Delineation System Panel, Barrier Mounted". The system panels shall remain attached to the barrier sections and shall become the property of the State of South Dakota upon completion of the project.

CONCRETE BARRIER END PROTECTION

Documentation on the crash cushion, which includes the drawing details of the crash cushion, details for the transition to the traffic control barrier, and details for the concrete anchoring pad, shall be provided to the Project Engineer at the pre-construction meeting.

The crash cushion shall be attached to the traffic control barrier with a transition that meets test level 3 requirements of NCHRP 350 or MASH at locations shown below in the Table of Barrier End Protection. For bidirectional traffic, the transition shall be placed on both sides of the crash cushion and barrier.

The Contractor shall certify that the crash cushion was installed according to the manufacturer's installation instructions.

All costs for furnishing and installing the crash cushion including the anchoring pad, anchors for connection to the pad, transitions to the concrete barrier(if required), materials, labor, equipment, and incidental items shall be paid for at the contract unit price per each for "Temporary Concrete Barrier End Protection".

One barrier end protection, removed after Phase 1, may be reinstalled for Phase 3. The cost for removal and reset of the barrier protection for Phase 3 shall be paid for at the contract unit price per each for "Reset Traffic Control Barrier End Protection".

TABLE OF BARRIER END PROTECTION

Location	Station	Location	Unidirectional / Bidirectional	Quantity (Reset)	Quantity (New)
I-29	44+50	RT- Phase1	Bidirectional		1
I-29	113+00	RT- Phase1	Bidirectional		1
I-29	118+00	RT- Phase1	Bidirectional		2
I-29	125+50	RT- Phase1	Bidirectional		1
I-29	171+50	RT- Phase1	Bidirectional		1
RampC	56+00	LT- Phase2	Bidirectional	1	
I-29	44+50	LT- Phase3	Bidirectional	1	
I-29	115+50	LT- Phase3	Bidirectional	1	
I-29	171+50	LT- Phase3	Bidirectional	1	
Total				4	6

TEMPORARY PAVEMENT MARKING

The Contractor shall place and maintain temporary pavement marking in accordance with Section 634 of the Specifications and the details in these plans.

Additional quantities for temporary pavement markings have been included in the estimate of quantities to be applied after the NGCS grinding and prior to the application of durable pavement markings.

Temporary Raised Pavement Markers shall be used in lieu of Temporary Pavement Marking Paint in transition and mainline areas which will not be covered by pavement marking paint. Measurements will be made and quantities will be paid for the actual quantities used.

Temporary Raised Pavement Markers shall be attached to the roadway surface with a flexible non-permanent bituminous adhesive capable of being removed from the roadway surface or with an adhesive approved by the Engineer. The cost for removal of Temporary Raised Pavement Markers shall be included in the contract unit price per mile for Raised Pavement Markers.

The Contractor will be required to remove the remaining Temporary Raised Pavement Markers prior to the placement of the permanent pavement markings. The Contractor shall use equipment that is not detrimental to the new roadway surface for removing pavement markings, as approved by the Engineer. The amount bid for the temporary pavement marking shall include the cost of removing the temporary marking installed on the project by the Contractor.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0292(96)073/IM 2292(90)0	C4b	C40

Revised: 9/25/2015 (MRK)

CONTRACTOR FURNISHED PORTABLE CHANGEABLE MESSAGE SIGN

Contractor Furnished Portable Changeable Message Signs shall be utilized on this project to advise the traveling public of project conditions and as stated under the notes for ADVANCE CLOSURE NOTICE. The Contractor shall furnish, position and maintain the message signs at locations as directed by the Engineer.

Each message sign shall be in a new or nearly new condition and consist of a message board, power supply and a message control system, all mounted on a heavy duty trailer. The message signs shall remain the property of the Contractor upon completion of the project.

The overall dimensions of the message board shall be a minimum of 108" wide x 72" high. The message board shall be enclosed in a rigidly framed, weather tight housing.

The message board shall contain a minimum of three message lines. Each message line shall be capable of displaying a minimum of 8 characters. Each character shall be approximately 18" high and shall be formed by 35 dots in a 5 x 7 matrix. The message boards shall be capable of changing the entire message content in not more than 100 milliseconds. No more than 2 displays shall be used within any message cycle.

All costs associated with obtaining, positioning, re-positioning, programming, re-programming, maintaining, and removing the message signs shall be incidental to the contract unit price per each for "Contractor Furnished Portable Changeable Message Sign".



SECTION E - ESTIMATE OF STRUCTURE QUANTITIES

DISMANTLING AND DELIVERY

- After the temporary bridge is no longer required, the Contractor shall dismantle and deliver the bridge to the Sioux Falls SDDOT Maintenance yard at 5316 W 60th St. N. Sioux Falls, SD 57107 and stockpile parts. Contact: Travis Dressen with the Sioux Falls Area at work (605) 367-5680 ext.; 2110: Travis.Dressen@state.sd.us. The temporary bridge and all associated hardware shall remain property of the SDDOT.
- The Contractor shall be responsible for any damage to the temporary bridge that occurs during the handling and dismantling operations, as well as during transportation to Sioux Falls SDDOT yard.
- Break down and remove the temporary bridge abutments in accordance with Section 110 of the Specifications. All portions of the temporary bridge abutments, except the bearing plates and the keeper angles, shall become property of the Contractor and shall be removed and disposed of on site obtained by the Contractor and approved by the Engineer in accordance with the Environmental Commitments.
- All costs for dismantling of the temporary structure, delivery to the Sioux Falls SDDOT yard, and removing the temporary abutments shall be paid for by the lump sum contract price for Salvage and Relocate Bridge.
- A bridge assembly scope with approximate assembly times, crew requirements, tools and equipment needed is available upon request from Acrow (phone 303-279-9088).
- The gravity large block retaining walls shall be removed and transported to the Sioux Falls SDDOT maintenance yard. See above address and contact information.
- For informational purposes only, the limits of the gravity large block retaining walls along I-229 ramp C alignment are Sta. 59 + 56.88 - 16.00' Rt. to Sta. 60 + 16.88 - 16.00' Rt. and Sta. 60 + 71.33 - 16.00' Lt. to Sta. 61 + 31.33 - 16.00' Lt.
- All costs for dismantling and delivery of the gravity large block retaining walls shall be paid for by the contract unit price per sq. ft. for Salvage Large Block Retaining Wall.

IM 0293(96)73
Str. No. 42-064-030
208' - 0" Composite Steel Girder Bridge

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E0010	Remove Concrete Bridge Approach Slab	233.2	SqYd
410E2600	Membrane Sealant Expansion Joint	87.1	Ft
460E0070	Class A45 Concrete, Bridge Repair	3.8	CuYd
460E0150	Concrete Approach Slab for Bridge	186.3	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	68.1	SqYd
460E0172	Concrete Patching Material, Bridge Deck	24.0	CuFt
460E0380	Install Dowel in Concrete	110	Each
480E0200	Epoxy Coated Reinforcing Steel	274	Lb
480E0504	No. 4 Rebar Splice	28	Each
480E0505	No. 5 Rebar Splice	52	Each
480E0506	No. 6 Rebar Splice	44	Each
491E0007	Two Coat Bridge Deck Polymer High Friction Chip Seal	920.0	SqYd
491E0110	Abrasive Blasting of Bridge Deck	920.0	SqYd
491E0120	Bridge Deck Grinding	920.0	SqYd
491E0130	Concrete Removal, Class A	4.0	SqYd
491E0140	Concrete Removal, Class B	4.0	SqYd
734E2020	Bridge Berm Slope Protection, Crushed Aggregate	211.2	SqYd

IM 0293(96)73
Str. No. 42-065-030
208' - 0" Composite Steel Girder Bridge

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E0010	Remove Concrete Bridge Approach Slab	233.2	SqYd
410E2600	Membrane Sealant Expansion Joint	87.1	Ft
460E0070	Class A45 Concrete, Bridge Repair	3.8	CuYd
460E0150	Concrete Approach Slab for Bridge	186.3	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	68.1	SqYd
460E0172	Concrete Patching Material, Bridge Deck	24.0	CuFt
460E0380	Install Dowel in Concrete	110	Each
480E0200	Epoxy Coated Reinforcing Steel	274	Lb
480E0504	No. 4 Rebar Splice	28	Each
480E0505	No. 5 Rebar Splice	52	Each
480E0506	No. 6 Rebar Splice	44	Each
491E0007	Two Coat Bridge Deck Polymer High Friction Chip Seal	920.0	SqYd
491E0110	Abrasive Blasting of Bridge Deck	920.0	SqYd
491E0120	Bridge Deck Grinding	920.0	SqYd
491E0130	Concrete Removal, Class A	4.0	SqYd
491E0140	Concrete Removal, Class B	4.0	SqYd
734E2020	Bridge Berm Slope Protection, Crushed Aggregate	211.2	SqYd

IM 0293(96)73
Str. No. 42-066-006
303' - 11 3/4" Composite Steel Girder Bridge

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E3310	Bridge Elevation Survey	Lump Sum	LS
009E5000	Concrete Penetrating Sealer	1,664.0	SqYd
260E1010	Base Course	3,228.0	Ton
410E0020	Structural Steel	Lump Sum	LS
410E2600	Membrane Sealant Expansion Joint	115.8	Ft
411E0100	Bridge Painting	Lump Sum	LS
420E0100	Structure Excavation, Bridge	198	CuYd
430E0200	Bridge End Embankment	66.2	CuYd
430E0300	Granular Bridge End Backfill	112.0	CuYd
460E0030	Class A45 Concrete, Bridge Deck	610.4	CuYd
460E0050	Class A45 Concrete, Bridge	610.4	CuYd
460E0150	Concrete Approach Slab for Bridge	423.2	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	92.2	SqYd
460E0215	Grinding Bridge Deck	2,245.4	SqYd
480E0100	Reinforcing Steel	66,633	Lb
480E0507	No. 7 Rebar Splice	50	Each
480E0514	No. 14 Rebar Splice	65	Each
510E0300	Preboring Pile	260	Ft
510E3521	HP 14x73 Steel Test Pile, Furnish and Drive	330	Ft
510E3525	HP 14x73 Steel Bearing Pile, Furnish and Drive	8,285	Ft
680E0040	4" Underdrain Pipe	180	Ft
680E2500	Porous Backfill	28.6	Ton
734E2020	Bridge Berm Slope Protection, Crushed Aggregate	1,028.6	SqYd
831E1010	Geogrid Reinforcement	2,598	SqYd

IM 0293(96)73
Str. No. 42-066-006
303' - 11 3/4" Composite Steel Girder Bridge
Alternate A

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
480E0300	Stainless Reinforcing Steel	137,967	Lb

IM 0293(96)73
Str. No. 42-066-006
303' - 11 3/4" Composite Steel Girder Bridge
Alternate B

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
480E0250	Zinc and Epoxy Dual-Coated Reinforcing Steel	137,967	Lb

Revised October 23, 2015 MG
Revised November 25, 2015 SJ

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0293(96)73	E2	E127

IM 0293(96)73
Str. No. 42-067-006
316' - 5 3/4" Composite Steel Girder Bridge

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E3310	Bridge Elevation Survey	Lump Sum	LS
009E5000	Concrete Penetrating Sealer	1,541.0	SqYd
260E1010	Base Course	2,584.0	Ton
410E0020	Structural Steel	Lump Sum	LS
410E2600	Membrane Sealant Expansion Joint	91.8	Ft
411E0100	Bridge Painting	Lump Sum	LS
420E0100	Structure Excavation, Bridge	198	CuYd
430E0200	Bridge End Embankment	1,723	CuYd
430E0300	Granular Bridge End Backfill	85.8	CuYd
460E0030	Class A45 Concrete, Bridge Deck	435.0	CuYd
460E0050	Class A45 Concrete, Bridge	347.9	CuYd
460E0150	Concrete Approach Slab for Bridge	310.0	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	73.9	SqYd
460E0215	Grinding Bridge Deck	1,768.5	SqYd
480E0100	Reinforcing Steel	44,019	Lb
480E0507	No. 7 Rebar Splice	118	Each
480E0514	No. 14 Rebar Splice	48	Each
510E0300	Preboring Pile	220	Ft
510E3521	HP 14x73 Steel Test Pile, Furnish and Drive	330	Ft
510E3525	HP 14x73 Steel Bearing Pile, Furnish and Drive	5,955	Ft
680E0040	4" Underdrain Pipe	156	Ft
680E2500	Porous Backfill	28.6	Ton
734E2020	Bridge Berm Slope Protection, Crushed Aggregate	926.5	SqYd
831E1010	Geogrid Reinforcement	2,598	SqYd

IM 0293(96)73
Str. No. 42-067-006
316' - 5 3/4" Composite Steel Girder Bridge
Alternate A

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
480E0300	Stainless Reinforcing Steel	114,998	Lb

IM 0293(96)73
Str. No. 42-067-006
316' - 5 3/4" Composite Steel Girder Bridge
Alternate B

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
480E0250	Zinc and Epoxy Dual-Coated Reinforcing Steel	114,998	Lb

IM 0293(96)73

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E3470	Salvage Large Block Retaining Wall	555	SqFt
250E0030	Incidental Work, Structure	Lump Sum	LS
380E2431	Concrete Barrier and 8' Plain Jointed Concrete Shoulder	180	Ft
380E2451	Concrete Barrier and 10' Plain Jointed Concrete Shoulder	190	Ft
410E0030	Structural Steel, Miscellaneous	Lump Sum	LS
410E4002	Salvage and Relocate Bridge	Lump Sum	LS
460E0070	Class A45 Concrete, Bridge Repair	0.2	CuYd
460E0300	Breakout Structural Concrete	0.2	CuYd
632E0072	4' Diameter Fixed Support Concrete Footing	413.0	Ft
632E0074	4.5' Diameter Fixed Support Concrete Footing	20.0	Ft
635E0040	4' Diameter Footing	352.0	Ft
650E2000	Concrete Barrier Curb and Gutter	328	Ft
650E2001	Concrete Barrier Curb and Gutter End Section	28	Ft

ESTIMATE OF STRUCTURE QUANTITIES

DESCRIPTION	QUANTITY	UNIT	REMARKS
Bridge Elevation Survey	Lump Sum	LS	
Concrete Penetrating Sealer	1884	SqYd	See Special Provision
Incidental Work, Structure	Lump Sum	LS	
Base Course	3222	Ton	
Structural Steel	Lump Sum	LS	See Special Provision
Membrane Sealant Expansion Joint	115.8	Ft	
Granular Bridge End Backfill	113.0	Cu Yd	
Class A45 Concrete, Bridge Deck	510.4	Cu Yd	
Class A45 Concrete, Bridge	515.4	Cu Yd	
Concrete Approach Slab for Bridge	432.2	Sq Yd	
Concrete Approach Sleeper Slab for Bridge	93.2	Sq Yd	
Reinforcing Steel	66633	Lb	
No. 7 Rebar Splice	150	Ea.	
No. 14 Rebar Splice	66	Ea.	
HP 14x73 Steel Test Pile, Furnish and Drive	330	Ft	
HP 14x73 Steel Bearing Pile, Furnish and Drive	8285	Ft	
Bridge Berm Slope Protection, Crushed Aggregate	1028.6	Sq Yd	
Geogrid Reinforcement	3559	Sq Yd	
Bridge End Embankment	1662	Cu Yd	
Bridge Painting	Lump Sum	LS	
4" Underdrain Pipe	186	Ft	
Porous Backfill	32.8	Ton	
Structure Excavation, Bridge	212	Cu Yd	
Preboring Pile	260	Ft	
Grooving Bridge Deck	2245.4	Sq Yd	

ALTERNATE A

Stainless Reinforcing Steel	137967	Lb	See Special Provision
-----------------------------	--------	----	-----------------------

ALTERNATE B

Zinc and Epoxy Dual Coated Reinforcing Steel	137967	Lb	ASTM 1055
--	--------	----	-----------

SPECIFICATIONS FOR BRIDGE

- Design Specifications: AASHTO LRFD Bridge Design Specifications, 2014 Edition with 2015 interims.
- 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

- AASHTO HL-93.
- Dead Load includes 22 psf for future wearing surface on the roadway.

DESIGN MATERIAL STRENGTHS

Concrete	$f'_c = 4,500$ psi
Reinforcing Steel	$f_y = 60,000$ psi
Piling (ASTM A572 Grade 50)	$f_y = 50,000$ psi
Structural Steel (ASTM A709 Gr. 36T2)	$f_y = 36,000$ psi
Structural Steel (ASTM A709 Gr. 50T2)	$f_y = 50,000$ psi

GENERAL CONSTRUCTION

- All mild reinforcing steel shall conform to ASTM A615, Grade 60. If Alternate A is chosen, all stainless reinforcing steel shall conform to ASTM 955, Grade 60. If Alternate B is chosen, all zinc and epoxy dual coated reinforcing steel shall conform to ASTM 1055, Grade 60.
- All exposed concrete corners and edges shall be chamfered 3/4" unless noted otherwise.
- Use 2" clear cover on all reinforcing steel except as shown.
- Contractor shall imprint on the structure the date of new construction as specified and detailed on Standard Plate No. 460.02.
- Barrier Curbs and End blocks shall be built normal to the grade.
- Request for construction joints or resteel 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 resteel.
- The elevation of the bridge deck is 1' - 6" above subgrade elevation.

INCIDENTAL WORK, STRUCTURE

- In place centerline Sta. 117+72.72 - 42.0' Lt. to centerline Sta. 121+36.15 - 42.0' Lt. is a 365.2' 4 span concrete box girder bridge with a 30'-0" clear roadway. The superstructure consists of reinforced concrete box girders with concrete jersey barrier continuous across the bridge. The deck has been overlaid with 3 1/2 inches of asphalt. The substructure consists of single column reinforced concrete piers and reinforced concrete vertical abutments, all of which are supported on timber piling.
- Break down and remove the existing bridge and approach/sleeper slabs to 1 foot below finished groundline, or as required to construct the new structure in accordance with Section 110 of the Specifications. All portions of the existing bridge shall be removed and disposed of by the Contractor on a site obtained by the Contractor and approved by the Engineer in accordance with the WASTE DISPOSAL SITE note found in Section A.
- 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 shall be 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.

DESIGN MIX OF CONCRETE

- All structural concrete shall be Class A45 unless otherwise indicated.
- Type II cement conforming to Section 750 is required except, Type III cement is required in the abutments. Type III cement shall contain a maximum 8% Tricalcium Aluminate (C_3A) and a maximum 0.6% Alkalies ($Na_2O + 0.658K_2O$).

- Grout design mix shall be as specified in Section 460.2 K of the Specifications. A compressive strength of 2000 psi shall be attained by the grout prior to erection of any beams. Chamfer edges of grout pads 3/4". The quantity of grout is included in and shall be paid for at the contract unit price per cubic yard for Class A45 Concrete, Bridge.

ABUTMENTS

- Preboring piling at each abutment is required to whichever is greater, ten feet or to natural ground.
- The HP 14x73 Piling were designed using a factored bearing resistance of 134 tons per pile. Piling shall develop a field verified nominal bearing resistance of 335 tons per pile.
- One test pile shall be driven at each abutment and will become part of the pile group.
- The contractor shall have sufficient pile splice material on hand before pile driving is started. See Standard Plate No. 510.40.
- Piles shall not be driven out of position by more than two inches in the direction parallel to the girder centerline. A pile-driving template shall be used to insure this accuracy.
- Each finished abutment shall include a Bridge Survey Marker. See Standard Plate No. 460.05
- Abutment backwalls and wings shall not be cast until after the deck has been poured.

ESTIMATE OF STRUCTURE QUANTITIES AND NOTES FOR 303' - 11 3/4" CONT. COMP. GIRDER BRIDGE

STR. NO. 42-066-006

APRIL 2015

2 OF 33

DESIGNED BY PW LINC01QS	CK. DES. BY DM 01QSGB02	DRAFTED BY BT	<i>Kevin N. Boeden</i> BRIDGE ENGINEER
-------------------------------	-------------------------------	------------------	---

FIELD BOLTED GIRDER SPLICES

1. Steel for splice and filler plates shall conform to ASTM A709 Gr. 50T2
1. Bolts in flange splices shall be placed with the heads down.
2. Bolts in web splice of exterior girders shall be placed with heads on exterior face of girders.
3. All bolts shall be fully tightened prior to removing temporary supports.

WELDING AND WELD INSPECTION

Main members referred to in Section 6.7 Nondestructive Testing of Bridge Welding Code are identified as follows: Girder webs, girder flanges, and bearing stiffeners. Ultrasonic testing of groove welds shall be used in lieu of radiography. See girder layout for stress categories and their locations along the girder.

FALSEWORK

1. The Contractor shall be required to include with the Falsework Plans, details for the construction of an adequate "Walk-Way" including railing.
2. Traffic control considerations require some construction activities to be performed over traffic. To protect traffic, a roadway canopy containment system will be required. Include details for the roadway canopy with the falsework plans. All costs for furnishing, installing and removing the roadway canopy shall be incidental to the contract unit price per cubic yard for Class A45 Concrete, Bridge Deck.

FALL PROTECTION

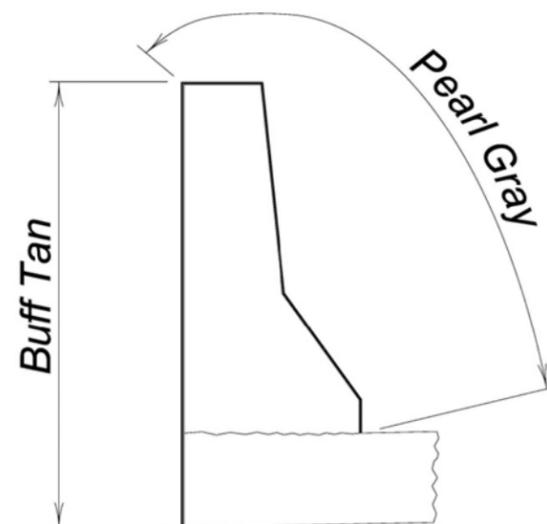
1. The Contractor shall install a Fall Protection System conforming to OSHA Regulations. When working on the girders prior to decking installation, a Horizontal Lifeline – or other OSHA approved system shall be installed. The Contractor shall have one Personal Fall Arrest System (PFAS) available for use by a Department Inspector. The PFAS shall be compatible with the installed Fall Protection System.
2. Modifications to any bridge components used to accommodate the Fall Protection System shall be shown on the Falsework Plans and/or the appropriate Shop Plans. Field welding to bridge components will not be allowed. Field placed concrete inserts or drilled-in anchor bolts will be allowed if approved by the Engineer. All costs associated with providing the Fall Protection System shall be incidental to the other contract items.

CLASS B COMMERCIAL TEXTURE FINISH

1. A Class B commercial texture finish shall be applied to the following areas:
 - a) ***Abutments:** all exposed surfaces to an elevation 1-foot below finished ground line.
 - b) **Barrier Rail:** all exposed surfaces (**front, **top and *back).
 - c) ***Slab:** edge of slab.
 - d) ***Bents:** all exposed surfaces.

** Color shall be "Pearl Gray" Federal Standard No. 26622
* Color shall be "Buff Tan"

The "Buff Tan" color shall match the tan color on the Solberg-Tallgrass structure over I-90.



2. The Class B commercial texture finish shall be applied in accordance with Section 460.3 L.1.c of the Specifications.
3. Where the Class B commercial texture finish is to be applied, concrete curing shall be accomplished with cotton or burlap mats and polyethylene sheeting. Curing shall continue for not less than seven days after placing concrete before the commercial texture finish is applied. The commercial texture finish shall be applied in accordance with the manufacturer's recommendations. The commercial texture finish itself does not require a specific cure except for drying.

SHOP PLANS

Shop plans shall be required as specified by the Specifications.

BOLT TESTING

The certified mill test reports for all bolts used on the project shall include the test results for all of the testing specified in section 972.2 D of the Specifications. Some of these tests are supplemental tests that must be requested at the time the bolts are ordered. It is the responsibility of the Contractor to notify the bolt supplier of these requirements.

PILE DRIVING

1. A drivability analysis was performed using the wave equation analysis program (GRLWEAP). The following pile hammers were evaluated and found to produce acceptable driving stresses:

Delmag D-30-32 SPI D-30 APE D36-26

2. Pile hammers not listed will require evaluation and approval prior to use from the Geotechnical Engineering Activity.

AS - BUILT ELEVATION SURVEY

The Contractor shall be responsible for recording the As-built deck elevations and bridge survey marker elevations at the locations shown in the Table of As-Built Elevations shown in the plans. All costs associated with obtaining the elevations including all equipment, labor, and any incidentals required shall be incidental to the contract lump sum price for Bridge Elevation Survey.

SDDOT's LRFD PILE DRIVING EQUATIONS

To determine the field verified nominal pile bearing resistance of driven piles the SDDOT uses the formulas below for timber, concrete, steel H-piling, and shell type piles.

For single action steam or air hammers and open cylinder top diesel hammers:

$$Q \text{ (drive)} = \frac{10.5WH}{S + 0.1} \times \frac{W}{W + M}$$

Where:

- Q = the field verified nominal pile bearing resistance in tons.
- W = the weight of the ram of an energy hammer in tons.
- H = the height of free fall of the hammer or ram in feet.
- M = the weight in tons of the driven mass and shall include the weight of the pile, the weight of the driving cap and the weight of the anvil, if used.
- E = the energy per blow in foot-tons.
- S = the average penetration in inches of the pile per blow for the last 10 blows for energy hammers.

NOTES (CONTINUED)

FOR
303' - 11 3/4" CONT. COMP. GIRDER BRIDGE

STR. NO. 42-066-006

APRIL 2015

Revised 11/25/15 SJ

APPROACH SLABS

- Sleeper slab riser shall be cast with the approach slab or cast after the approach slab is placed. Care shall be taken to ensure the correct grade is maintained across the joint.
- The use of an approved finishing machine will be required during placement of Class A45 Concrete for the approach slabs. Concrete placement in front of the machine shall be kept parallel to the screed.
- The concrete in the approach slab shall be tined normal to centerline roadway.
- Concrete Approach Sleeper Slab for Bridge will be paid for at the contract unit price per square yard. This payment shall be full compensation for all excavation, furnishing, hauling, and placing all materials including concrete and reinforcing steel; for disposal of all excavated material and surplus materials; and for labor, tools, equipment, and any incidentals necessary to complete this item of work.
- Concrete Approach Slab for Bridge will be paid for at the contract unit price per square yard. This payment shall be full compensation for all excavation, furnishing, hauling and placing all materials including concrete, asphalt paint, or 4 mil polyethylene sheeting, elastic joint sealer and reinforcing steel; for disposal of all excavated material and surplus materials and for labor, tools, equipment, and any incidentals necessary to complete this item of work.

CRUSHED AGGREGATE SLOPE PROTECTION

- This work shall consist of paving the bridge berm slopes with crushed aggregate slope protection for control and prevention of berm erosion.
- The aggregate used in the crushed aggregate slope protection shall conform to the requirements of Section 820 of the Specifications for coarse aggregate for Class A Concrete (size no. 1).
- The asphalt material used in the crushed aggregate slope protection shall be either Asphalt Type MC-70 or MC-250, or emulsified Asphalt Type RS-1, RS-2, CRS-1 or CRS-2 meeting the requirements of Section 890 of the Specifications and AASHTO M81, AASHTO M140, AASHTO M 82, and AASHTO M208 respectively.
- The surface upon which the slope protection is to be placed shall be smooth, uniform, and free from foreign material. The top surface of the slope protection shall conform to the dimensions, elevations, and slopes shown in the plans.
- The crushed aggregate shall be shaped and compacted to provide a stable, smooth, and uniform surface.
- The asphalt material shall be applied at a rate sufficient to assure penetration and binding of the aggregate in the upper 2 inches of the slope protection. (Estimated Rate = 1.3 gallons per square yard.) The surfaces of the adjacent structure shall be protected from spattering or discoloration from the asphalt material.

- Payment for crushed aggregate slope protection shall be at the contract unit price per square yard for Bridge Berm Slope Protection, Crushed Aggregate and shall be full compensation for slope paving, including furnishing all materials, labor, and equipment necessary or incidental to the satisfactory completion of this work. Payment will be for plans quantity.

REINFORCED GRANULAR EMBANKMENT FOR BRIDGE END EMBANKMENT

- The geogrid will be a biaxial grid of single layer construction. Vibratory welded, integrally formed, or woven and coated geogrids will be acceptable. Grids with laser welded grid junctions will not be allowed. The geogrid will be certified by the supplier to meet the following specification prior to installation:

Property	Test	MARV
Wide Width Strip Tensile Strength (Ultimate)	ASTM D 6637 Method B	850lb/ft MD and XD

- Geogrid will be paid for at the contract unit price per sq. yd. for Geogrid Reinforcement. Payment quantities will be based on area covered plus 15%. Overlaps are accounted for by the additional 15%. Payment will be full compensation for furnishing and installing the geogrid only.
- Granular Material will conform to the specification for Base Course in Section 882 of the Specifications. Granular Material will be paid for at the contract unit price per ton for Base Course. Payment will be full compensation for furnishing and placing this material.
- The geogrid shall be placed on a level surface and overlapped a minimum of 2 feet.
- The geogrid will be placed as taut as possible with minimal wrinkles. Placement will be done so that subsequent granular cover material does not shove, wrinkle or distort the in place geogrid. The overlaps will be shingled in a manner that assures granular material will not be forced under the geogrid during backfilling operations. The geogrid may be held in place with small piles of granular material or staples.
- Base course will be dumped at least 20 feet behind the leading edge of the backfill and pushed into place with a loader or dozer from the covered areas to the uncovered areas. No traffic will be allowed on the uncovered geogrid.
- The base course and adjacent soil embankment shall be built simultaneously in horizontal layers. Base course shall be placed in 6 inch maximum lifts and compacted to 97 percent of maximum standard proctor dry density using a smooth face vibratory roller or vibratory plate compactor. Each layer of granular material shall be thoroughly watered prior to and during compaction.
- Density tests within the berm limits shall consist of tests conducted both in the soil embankment and the base course according to the modified zone requirements below:

Zone	Depth (ft.)	Min. required tests
1	0-1	1
2	1-3	1
3	3-5	1
4	5 to Bottom	1 per 3 vertical feet

- The zone requirement will be in force at both bridge berms.

BRIDGE DECK GROOVING

The bridge deck shall be grooved following the curing period. The grooves shall be perpendicular to centerline of the deck, unless otherwise noted. On skewed bridge decks, the grooving shall not result in a "staggered" pattern at the bridge ends. The grooving shall be accomplished using a mechanized multi-blade saw capable of sawing 1/8" wide by 3/16" (+ 1/16") deep grooves. The spacing between the individual grooves shall be randomly spaced and shall vary between 5/8" and 1-5/8" with 50% of the spaces being 1 inch or less. Overlapping of the grooves shall not be allowed. The 12 inch width of the bridge deck adjacent to each curb shall be left ungrooved. Bridge Deck Grooving will be measured to the nearest 0.1 Square Yard. Bridge Deck Grooving will be paid for at the contract unit price per square yard. Payment will be full compensation for labor, equipment, tools, materials and all incidentals required to complete the work.

NOTES (CONTINUED)

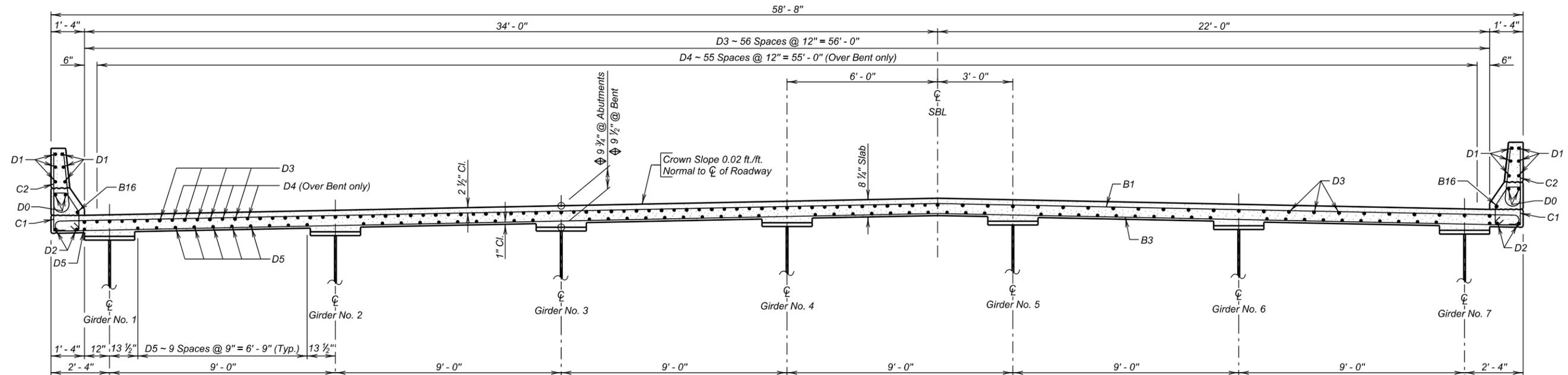
FOR
303' - 11 3/4" CONT. COMP. GIRDER BRIDGE

STR. NO. 42-066-006

APRIL 2015

5 OF 33

Revised 11/25/15 SJ



SEC. C - C

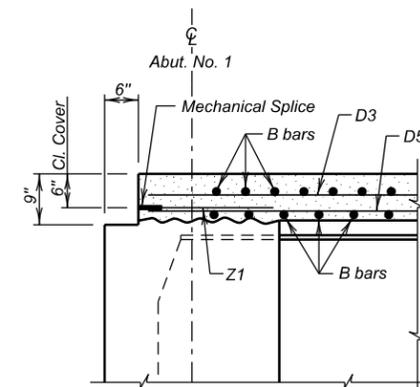
REINFORCING SCHEDULE

Mk.	No.	Size	Length	Type	
∅	B1	632	5	59'-6"	1
∅	B2	85	5	62'-11"	1
∅	B3	527	4	58'-4"	Str.
∅	B4	71	4	61'-4"	Str.
∅	B15	12	5	14'-6"	Str.
∅	B16	12	4	54'-6"	Str.
∅	B17	8	4	8'-6"	19B
∅	B18	12	8	4'-3"	19B
∅	B19	12	5	4'-2"	17
∅	C1	634	5	5'-7"	T1A
∅	C2	606	5	5'-1"	S11
∅	C3	4	5	5'-0"	S11
∅	C4	4	5	5'-0"	S11
∅	C5	4	5	5'-0"	S11
∅	C6	4	5	6'-8"	T1
∅	C7	4	5	6'-9"	T1
∅	C8	4	5	6'-11"	T1
∅	C9	4	5	7'-0"	T1
∅	C10	16	6	5'-9"	T1A
∅	C11	16	5	7'-1"	T1
∅	C12	4	6	5'-6"	17
∅	C13	4	5	5'-4"	17
∅	D0	24	4	56'-8"	Str.
∅	D1	72	4	52'-9"	Str.
∅	D2	24	5	56'-1"	Str.
∅	D3	342	5	51'-11"	Str.
∅	D4	168	6	54'-3"	Str.
∅	D5	372	5	52'-4"	Str.
∅	Z1	150	7	2'-0"	Str.

Bending Details	

∅ Dimensions are at \bar{C} bearing; at other points along the girders this dimension shall be computed as shown on the SLAB FORM ELEVATIONS & ERECTION DATA sheets.

NOTE: Barrier curb details are shown on END BLOCK AND BARRIER CURB DETAILS sheet.



SEC. B - B

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
★ Class A45 Concrete, Bridge Deck	Cu. Yd.	510.4
△ Structural Steel	Lump Sum	Lump Sum
No. 7 Rebar Splice	Each	150
☆ Bridge Painting	Lump Sum	Lump Sum
∅ Concrete Penetrating Sealer	Sq. Yd.	1884
Grooving Bridge Deck	Sq. Yd.	1816.7

ALTERNATE A		
ITEM	UNIT	QUANTITY
Stainless Reinforcing Steel	Lb.	134465

ALTERNATE B		
ITEM	UNIT	QUANTITY
Zinc and Dual Coated Reinforcing Steel	Lb.	134465

- ★ Concrete quantity for Barrier Curb is 0.0842 Cu. Yd. per foot and for End Block is 1.1580 Cu. Yd. per 12' End Block.
- △ For informational purposes only, the estimated weight of the structural steel is 915246 pounds.
- ☆ For informational purposes only the estimated area to be painted is 45895 sq. ft.
- ∅ Apply to bridge deck between barrier curbs.

SUPERSTRUCTURE DETAILS (C)
 FOR
SOUTHBOUND LANES
303' - 11 3/4" CONT. COMP. GIRDER BRIDGE
 56' - 0" ROADWAY
 OVER I-229
 STA. 118 + 04.59 TO 121 + 08.57
 STR. NO. 42-066-006

33° RHF SKEW
 SEC. 7-T100N-R50W
 IM 0293(96)73
 HL-93

LINCOLN COUNTY
 S. D. DEPT. OF TRANSPORTATION
 APRIL 2015

NOTES-
 ∅ See cutting diagram.
 ∅ Tip bars as required to maintain top and bottom clear cover.
 All dimensions are out to out of bars.

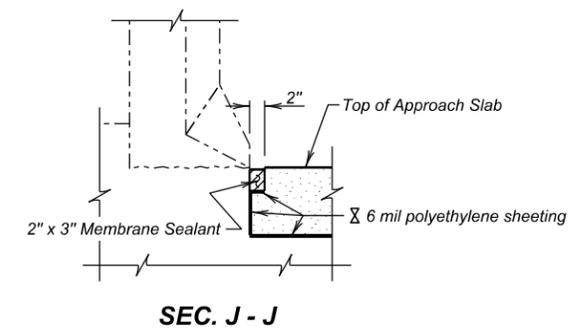
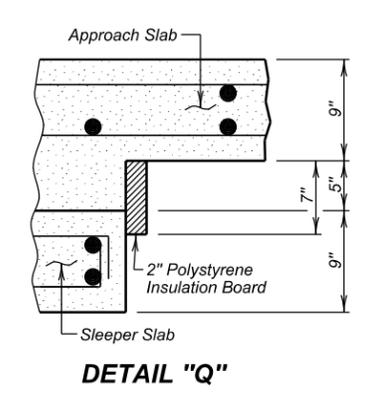
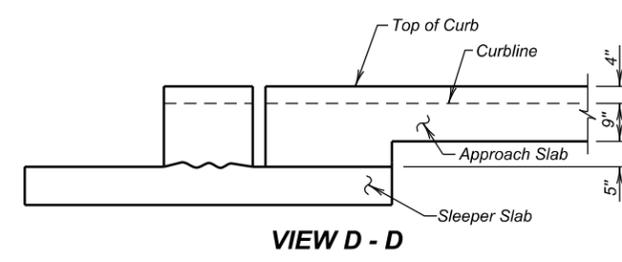
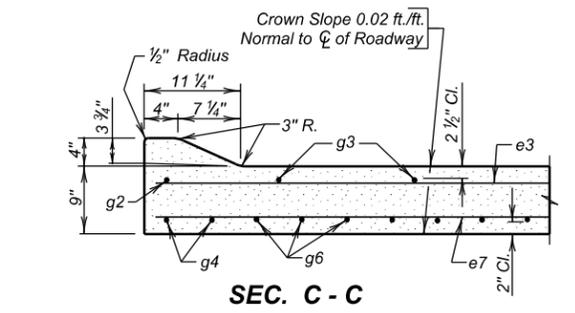
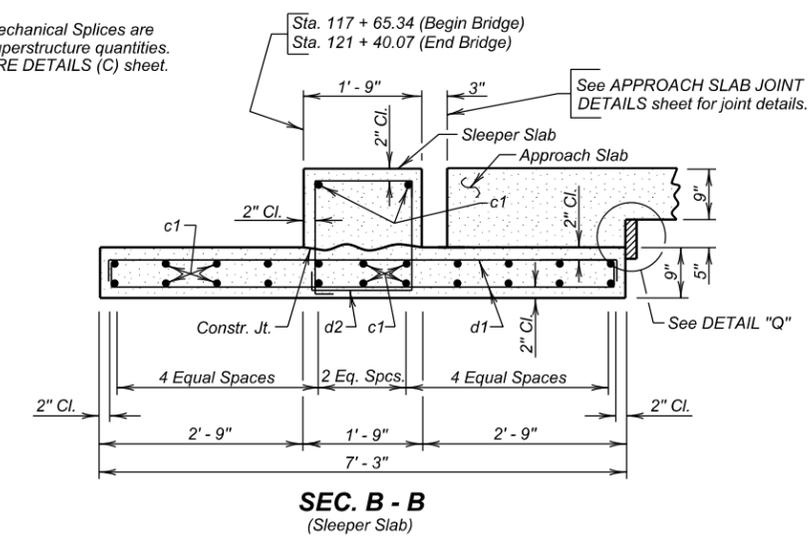
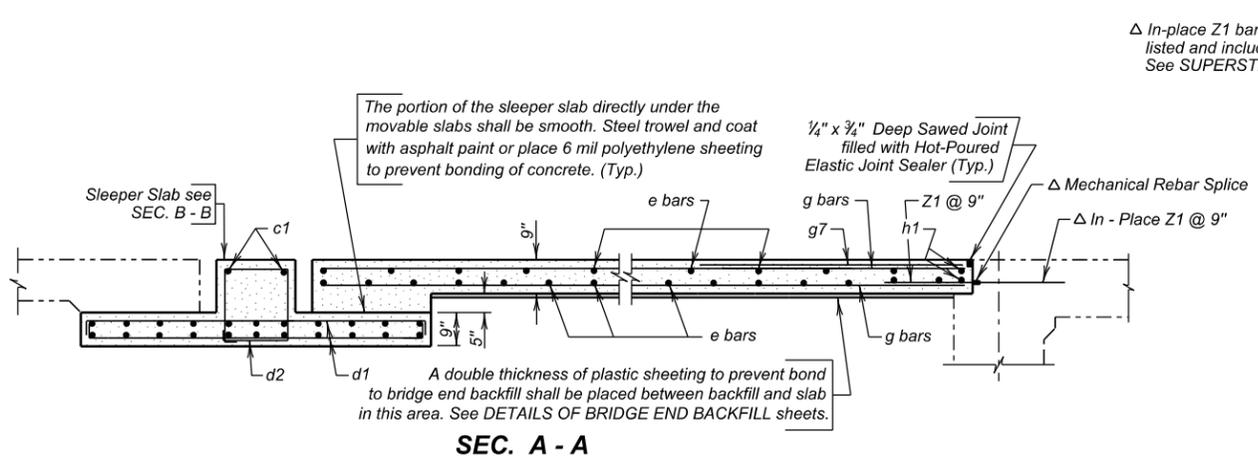
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0293(96)73	E77	E127

Revised 11/25/15 SJ

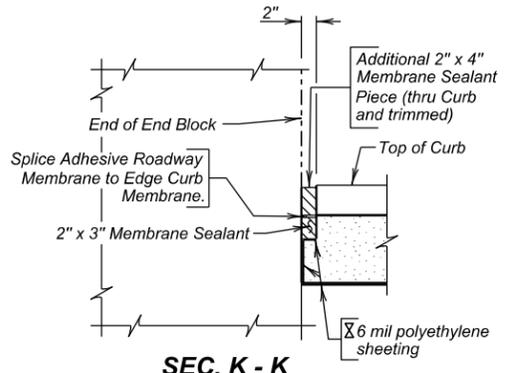
REINFORCING SCHEDULE				Bending Details	
(For Two Approach Slabs and Two Sleeper Slabs)					
Mk.	No.	Size	Length	Type	
Approach Slabs					
e1	6	4	57'-7"	Str.	
e2	16	4	56'-7"	Str.	
e3	17	4	72'-11"	Str.	
e4	6	4	17'-11"	Str.	
e5	8	6	57'-7"	Str.	
e6	24	6	56'-7"	Str.	
e7	25	6	74'-7"	Str.	
e8	10	6	18'-10"	Str.	
g1	2	4	4'-0"	Str.	
g2	2	4	40'-8"	Str.	
g3	37	4	67'-1"	Str.	
g4	4	8	40'-9"	Str.	
g5	4	8	4'-0"	Str.	
g6	112	8	67'-2"	Str.	
g7	36	4	6'-0"	Str.	
h1	8	6	34'-3"	Str.	
Z1	150	7	2'-0"	Str.	
Sleeper Slabs					
c1	48	5	57'-7"	Str.	15'-7" 51'-7" g6
d1	232	4	7'-9"	2	16'-0" 51'-1" g3
d2	116	4	6'-9"	T2	2'-6" 16'-4" e8
					18'-10" 55'-9" e7
					3'-2" 14'-9" e4
					18'-0" 54'-11" e3
					54'-11" 18'-0" e3
					14'-9" 3'-2" e4
					55'-9" 18'-10" e7
					16'-4" 2'-6" e8
					51'-1" 16'-0" g3
					51'-7" 15'-7" g6

ESTIMATED QUANTITIES		
(For Two Approach Slabs & Two Sleeper Slabs)		
ITEM	UNIT	QUANTITY
Concrete Approach Slab for Bridge	Sq. Yd.	432.2
Concrete Approach Sleeper Slab for Bridge	Sq. Yd.	93.2
Grooving Bridge Deck	Sq. Yd.	428.7

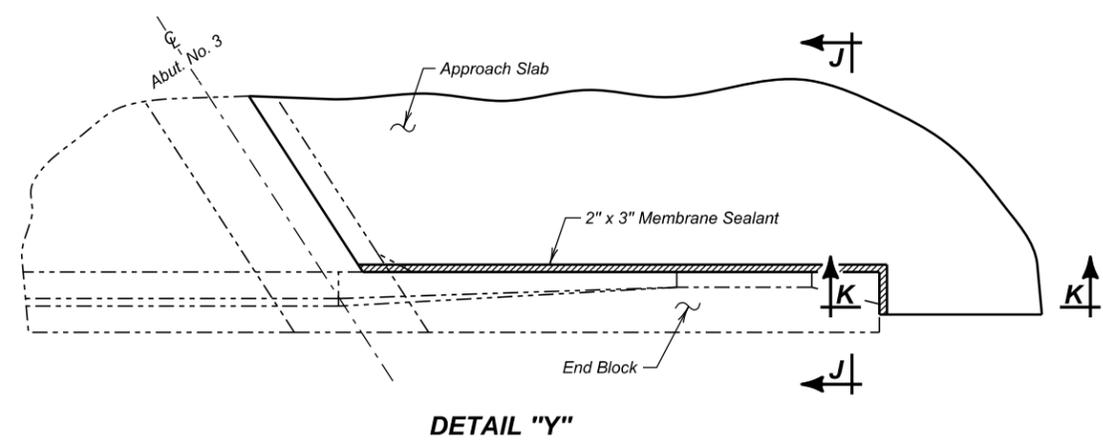
- 112.5 Cu. Yds. Concrete in Approach Slabs.
 - 31001 Lbs. Epoxy coated Re-Steel in Approach Slabs.
 - 32.1 Cu. Yds. Concrete in Sleeper Slabs.
 - 4607 Lbs. Epoxy coated Re-Steel in Sleeper Slab.
 - 67.5 Sq. Ft. of 2" Polystyrene Insulation Board
 - 49 Ft. of Membrane Sealant adjacent to wings.
- Items 1 thru 6 are approximate quantities contained in the above bid items and are for information only.



NOTE:
See APPROACH SLAB JOINT DETAILS sheet for notes regarding Membrane Sealant Expansion Joint.



6 mil polyethylene sheeting shall not interfere with the bond between the Membrane Sealant and the approach slab.



DETAILS OF APPROACH SLAB ADJACENT TO BRIDGE (B)
FOR
SOUTHBOUND LANES
303' - 11 3/4" CONT. COMP. GIRDER BRIDGE
56' - 0" ROADWAY
OVER I-229
STA. 118 + 04.59 TO 121 + 08.57
STR. NO. 42-066-006

33° RHF SKEW
SEC. 7-T100N-R50W
IM 0293(96)73
HL-93

ESTIMATE OF STRUCTURE QUANTITIES

DESCRIPTION	QUANTITY	UNIT	REMARKS
Bridge Elevation Survey	Lump Sum	LS	
Concrete Penetrating Sealer	1541	SqYd	See Special Provision
Incidental Work, Structure	Lump Sum	LS	
Base Course	2584	Ton	
Structural Steel	Lump Sum	LS	See Special Provision
Membrane Sealant Expansion Joint	91.8	Ft	
Granular Bridge End Backfill	85.8	Cu Yd	
Class A45 Concrete, Bridge Deck	435.0	Cu Yd	
Class A45 Concrete, Bridge	347.9	Cu Yd	
Concrete Approach Slab for Bridge	310.0	SqYd	
Concrete Approach Sleeper Slab for Bridge	73.9	Sq Yd	
Reinforcing Steel	44019	Lb	
No. 14 Rebar Splice	48	Ea.	
No. 7 Rebar Splice	118	Ea.	
HP 14x73 Steel Test Pile, Furnish and Drive	330	Ft	
HP 14x73 Steel Bearing Pile, Furnish and Drive	5955	Ft	
Bridge Berm Slope Protection, Crushed Aggregate	926.5	Sq Yd	
Geogrid Reinforcement	2598	Sq Yd	
Bridge End Embankment	1723	Cu Yd	
Bridge Painting	Lump Sum	L.S.	
4" Underdrain Pipe	156	Ft	
Porous Backfill	28.6	Ton	
Structure Excavation, Bridge	198	Cu Yd	
Preboring Pile	220	Ft	
Grooving Bridge Deck	1768.5	Sq Yd	

ALTERNATE A

Stainless Reinforcing Steel	114998	Lb	See Special Provision
-----------------------------	--------	----	-----------------------

ALTERNATE B

Zinc and Epoxy Dual Coated Reinforcing Steel	114998	Lb	ASTM 1055
--	--------	----	-----------

SPECIFICATIONS FOR BRIDGE

- Design Specifications: AASHTO LRFD Bridge Design Specifications, 2014 Edition with 2015 interims.
- 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

- AASHTO HL-93.
- Dead Load includes 22 psf for future wearing surface on the roadway.

DESIGN MATERIAL STRENGTHS

Concrete	$f_c = 4,500$ psi
Reinforcing Steel	$f_y = 60,000$ psi
Piling (ASTM A572 Grade 50)	$f_y = 50,000$ psi
Structural Steel (ASTM A709 Gr. 36T2)	$f_y = 36,000$ psi
Structural Steel (ASTM A709 Gr. 50T2)	$f_y = 50,000$ psi

GENERAL CONSTRUCTION

- All mild reinforcing steel shall conform to ASTM A615, Grade 60. If Alternate A is chosen, all stainless reinforcing steel shall conform to ASTM 955, Grade 60. If Alternate B is chosen, all zinc and epoxy dual coated reinforcing steel shall conform to ASTM 1055, Grade 60.
- All exposed concrete corners and edges shall be chamfered 3/4" unless noted otherwise.
- Use 2" clear cover on all reinforcing steel except as shown.
- Contractor shall imprint on the structure the date of new construction as specified and detailed on Standard Plate No. 460.02.
- Barrier Curbs and End blocks shall be built normal to the grade.
- Request for construction joints or resteel 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 resteel.
- The elevation of the bridge deck is 1' - 6" above subgrade elevation.

INCIDENTAL WORK, STRUCTURE

- In place centerline Sta. 118+32.93 – 42.0" Rt. to centerline Sta. 121+95.93 – 42.0' Rt. is a 365.2' 4 span concrete box girder bridge with a 30'-0" clear roadway. The superstructure consists of reinforced concrete box girders with concrete jersey barrier continuous across the bridge. The deck has been overlaid with 3 1/2 inches of asphalt. The substructure consists of single column reinforced concrete piers and reinforced concrete vertical abutments, all of which are supported on timber piling.
- Break down and remove the existing bridge and approach/sleeper slabs to 1 foot below finished groundline, or as required to construct the new structure in accordance with Section 110 of the Specifications. All portions of the existing bridge shall be removed and disposed of by the Contractor on a site obtained by the Contractor and approved by the Engineer in accordance with the WASTE DISPOSAL SITE note found in Section A.
- 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 shall be 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.

DESIGN MIX OF CONCRETE

- All structural concrete shall be Class A45 unless otherwise indicated.
- Type II cement conforming to Section 750 is required except, Type III cement is required in the abutments. Type III cement shall contain a maximum 8% Tricalcium Aluminate (C_3A) and a maximum 0.6% Alkalies ($Na_2O + 0.658K_2O$).

- Grout design mix shall be as specified in Section 460.2 K of the Specifications. A compressive strength of 2000 psi shall be attained by the grout prior to erection of any beams. Chamfer edges of grout pads 3/4". The quantity of grout is included in and shall be paid for at the contract unit price per cubic yard for Class A45 Concrete, Bridge.

ABUTMENTS

- Preboring piling at each abutment is required to whichever is greater, ten feet or to natural ground.
- The HP 14x73 Piling were designed using a factored bearing resistance of 134 tons per pile. Piling shall develop a field verified nominal bearing resistance of 335 tons per pile.
- One test pile shall be driven at each abutment and will become part of the pile group.
- The contractor shall have sufficient pile splice material on hand before pile driving is started. See Standard Plate No. 510.40.
- Piles shall not be driven out of position by more than two inches in the direction parallel to the girder centerline. A pile-driving template shall be used to insure this accuracy.
- Each finished abutment shall include a Bridge Survey Marker. See Standard Plate No. 460.05
- Abutment backwalls and wings shall not be cast until after the deck has been poured.

ESTIMATE OF STRUCTURE QUANTITIES AND NOTES FOR 316' - 5 3/4" CONT. COMP. GIRDER BRIDGE

STR. NO. 42-067-006

APRIL 2015

2 OF 32

DESIGNED BY PW LINC010S	CK. DES. BY DM 01QSGA02	DRAFTED BY BT	<i>Kevin N. Boeden</i> BRIDGE ENGINEER
-------------------------------	-------------------------------	------------------	---

FIELD BOLTED GIRDER SPLICES

1. Steel for splice and filler plates shall conform to ASTM A709 Gr. 50T2
1. Bolts in flange splices shall be placed with the heads down.
2. Bolts in web splice of exterior girders shall be placed with heads on exterior face of girders.
3. All bolts shall be fully tightened prior to removing temporary supports.

WELDING AND WELD INSPECTION

Main members referred to in Section 6.7 Nondestructive Testing of Bridge Welding Code are identified as follows: Girder webs, girder flanges, and bearing stiffeners. Ultrasonic testing of groove welds shall be used in lieu of radiography. See girder layout for stress categories and their locations along the girder.

FALSEWORK

1. The Contractor shall be required to include with the Falsework Plans, details for the construction of an adequate "Walk-Way" including railing.
2. Traffic control considerations require some construction activities to be performed over traffic. To protect traffic, a roadway canopy containment system will be required. Include details for the roadway canopy with the falsework plans. All costs for furnishing, installing and removing the roadway canopy shall be incidental to the contract unit price per cubic yard for Class A45 Concrete, Bridge Deck.

FALL PROTECTION

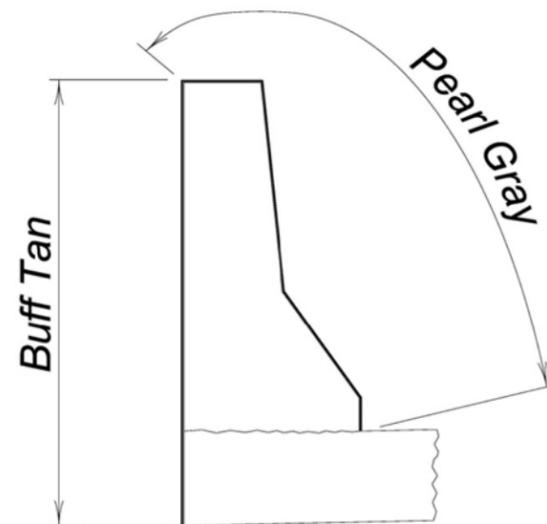
1. The Contractor shall install a Fall Protection System conforming to OSHA Regulations. When working on the girders prior to decking installation, a Horizontal Lifeline – or other OSHA approved system shall be installed. The Contractor shall have one Personal Fall Arrest System (PFAS) available for use by a Department Inspector. The PFAS shall be compatible with the installed Fall Protection System.
2. Modifications to any bridge components used to accommodate the Fall Protection System shall be shown on the Falsework Plans and/or the appropriate Shop Plans. Field welding to bridge components will not be allowed. Field placed concrete inserts or drilled-in anchor bolts will be allowed if approved by the Engineer. All costs associated with providing the Fall Protection System shall be incidental to the other contract items.

CLASS B COMMERCIAL TEXTURE FINISH

1. A Class B commercial texture finish shall be applied to the following areas:
 - a) ***Abutments:** all exposed surfaces to an elevation 1-foot below finished ground line.
 - b) **Barrier Rail:** all exposed surfaces (**front, **top and *back).
 - c) ***Slab:** edge of slab.
 - d) ***Bents:** all exposed surfaces.

** Color shall be "Pearl Gray" Federal Standard No. 26622
* Color shall be "Buff Tan"

The "Buff Tan" color shall match the tan color on the Solberg-Tallgrass structure over I-90.



2. The Class B commercial texture finish shall be applied in accordance with Section 460.3 L.1.c of the Specifications.
3. Where the Class B commercial texture finish is to be applied, concrete curing shall be accomplished with cotton or burlap mats and polyethylene sheeting. Curing shall continue for not less than seven days after placing concrete before the commercial texture finish is applied. The commercial texture finish shall be applied in accordance with the manufacturer's recommendations. The commercial texture finish itself does not require a specific cure except for drying.

SHOP PLANS

Shop plans shall be required as specified by the Specifications.

BOLT TESTING

The certified mill test reports for all bolts used on the project shall include the test results for all of the testing specified in section 972.2 D of the Specifications. Some of these tests are supplemental tests that must be requested at the time the bolts are ordered. It is the responsibility of the Contractor to notify the bolt supplier of these requirements.

PILE DRIVING

1. A drivability analysis was performed using the wave equation analysis program (GRLWEAP). The following pile hammers were evaluated and found to produce acceptable driving stresses:

Delmag D-30-32 SPI D-30 APE D36-26
2. Pile hammers not listed will require evaluation and approval prior to use from the Geotechnical Engineering Activity.

AS - BUILT ELEVATION SURVEY

The Contractor shall be responsible for recording the As-built deck elevations and bridge survey marker elevations at the locations shown in the Table of As-Built Elevations shown in the plans. All costs associated with obtaining the elevations including all equipment, labor, and any incidentals required shall be incidental to the contract lump sum price for Bridge Elevation Survey.

SDDOT's LRFD PILE DRIVING EQUATIONS

To determine the field verified nominal pile bearing resistance of driven piles the SDDOT uses the formulas below for timber, concrete, steel H-piling, and shell type piles.

For single action steam or air hammers and open cylinder top diesel hammers:

$$Q \text{ (drive)} = \frac{10.5WH}{S + 0.1} \times \frac{W}{W + M}$$

Where:

- Q = the field verified nominal pile bearing resistance in tons.
- W = the weight of the ram of an energy hammer in tons.
- H = the height of free fall of the hammer or ram in feet.
- M = the weight in tons of the driven mass and shall include the weight of the pile, the weight of the driving cap and the weight of the anvil, if used.
- E = the energy per blow in foot-tons.
- S = the average penetration in inches of the pile per blow for the last 10 blows for energy hammers.

NOTES (CONTINUED)

FOR
316' - 5 3/4" CONT. COMP. GIRDER BRIDGE

STR. NO. 42-067-006

APRIL 2015

Revised 11/25/15 SJ

APPROACH SLABS

- Sleeper slab riser shall be cast with the approach slab or cast after the approach slab is placed. Care shall be taken to ensure the correct grade is maintained across the joint.
- The use of an approved finishing machine will be required during placement of Class A45 Concrete for the approach slabs. Concrete placement in front of the machine shall be kept parallel to the screed.
- The concrete in the approach slab shall be tined normal to centerline roadway.
- Concrete Approach Sleeper Slab for Bridge will be paid for at the contract unit price per square yard. This payment shall be full compensation for all excavation, furnishing, hauling, and placing all materials including concrete and reinforcing steel; for disposal of all excavated material and surplus materials; and for labor, tools, equipment, and any incidentals necessary to complete this item of work.
- Concrete Approach Slab for Bridge will be paid for at the contract unit price per square yard. This payment shall be full compensation for all excavation, furnishing, hauling, and placing all materials including concrete, asphalt paint, or 4 mil polyethylene sheeting, elastic joint sealer and reinforcing steel; for disposal of all excavated material and surplus materials and for labor, tools, equipment, and any incidentals necessary to complete this item of work.

CRUSHED AGGREGATE SLOPE PROTECTION

- This work shall consist of paving the bridge berm slopes with crushed aggregate slope protection for control and prevention of berm erosion.
- The aggregate used in the crushed aggregate slope protection shall conform to the requirements of Section 820 of the Specifications for coarse aggregate for Class A Concrete (size no. 1).
- The asphalt material used in the crushed aggregate slope protection shall be either Asphalt Type MC-70 or MC-250, or emulsified Asphalt Type RS-1, RS-2, CRS-1 or CRS-2 meeting the requirements of Section 890 of the Specifications and AASHTO M81, AASHTO M140, AASHTO M 82, and AASHTO M208 respectively.
- The surface upon which the slope protection is to be placed shall be smooth, uniform, and free from foreign material. The top surface of the slope protection shall conform to the dimensions, elevations, and slopes shown in the plans.
- The crushed aggregate shall be shaped and compacted to provide a stable, smooth, and uniform surface.
- The asphalt material shall be applied at a rate sufficient to assure penetration and binding of the aggregate in the upper 2 inches of the slope protection. (Estimated Rate = 1.3 gallons per square yard.) The surfaces of the adjacent structure shall be protected from spattering or discoloration from the asphalt material.

- Payment for crushed aggregate slope protection shall be at the contract unit price per square yard for Bridge Berm Slope Protection, Crushed Aggregate and shall be full compensation for slope paving, including furnishing all materials, labor, and equipment necessary or incidental to the satisfactory completion of this work. Payment will be for plans quantity.

REINFORCED GRANULAR EMBANKMENT FOR BRIDGE END EMBANKMENT

- The geogrid will be a biaxial grid of single layer construction. Vibratory welded, integrally formed, or woven and coated geogrids will be acceptable. Grids with laser welded grid junctions will not be allowed. The geogrid will be certified by the supplier to meet the following specification prior to installation:

Property	Test	MARV
----------	------	------

Wide Width Strip Tensile Strength (Ultimate)	ASTM D 6637 Method B	850lb/ft MD and XD
--	----------------------	--------------------

- Geogrid will be paid for at the contract unit price per sq. yd. for Geogrid Reinforcement. Payment quantities will be based on area covered plus 15%. Overlaps are accounted for by the additional 15%. Payment will be full compensation for furnishing and installing the geogrid only.
- Granular Material will conform to the specification for Base Course in Section 882 of the Specifications. Granular Material will be paid for at the contract unit price per ton for Base Course. Payment will be full compensation for furnishing and placing this material.
- The geogrid shall be placed on a level surface and overlapped a minimum of 2 feet.
- The geogrid will be placed as taut as possible with minimal wrinkles. Placement will be done so that subsequent granular cover material does not shove, wrinkle or distort the in place geogrid. The overlaps will be shingled in a manner that assures granular material will not be forced under the geogrid during backfilling operations. The geogrid may be held in place with small piles of granular material or staples.
- Base course will be dumped at least 20 feet behind the leading edge of the backfill and pushed into place with a loader or dozer from the covered areas to the uncovered areas. No traffic will be allowed on the uncovered geogrid.
- The base course and adjacent soil embankment shall be built simultaneously in horizontal layers. Base course shall be placed in 6 inch maximum lifts and compacted to 97 percent of maximum standard proctor dry density using a smooth face vibratory roller or vibratory plate compactor. Each layer of granular material shall be thoroughly watered prior to and during compaction.
- Density tests within the berm limits shall consist of tests conducted both in the soil embankment and the base course according to the modified zone requirements below:

Zone	Depth (ft.)	Min. required tests
1	0-1	1
2	1-3	1
3	3-5	1
4	5 to Bottom	1 per 3 vertical feet

- The zone requirement will be in force at both bridge berms.

BRIDGE DECK GROOVING

The bridge deck shall be grooved following the curing period. The grooves shall be perpendicular to centerline of the deck, unless otherwise noted. On skewed bridge decks, the grooving shall not result in a "staggered" pattern at the bridge ends. The grooving shall be accomplished using a mechanized multi-blade saw capable of sawing 1/8" wide by 3/16" (+ 1/16") deep grooves. The spacing between the individual grooves shall be randomly spaced and shall vary between 5/8" and 1-5/8" with 50% of the spaces being 1 inch or less. Overlapping of the grooves shall not be allowed. The 12 inch width of the bridge deck adjacent to each curb shall be left ungrooved. Bridge Deck Grooving will be measured to the nearest 0.1 Square Yard. Bridge Deck Grooving will be paid for at the contract unit price per square yard. Payment will be full compensation for labor, equipment, tools, materials and all incidentals required to complete the work.

NOTES (CONTINUED)

FOR

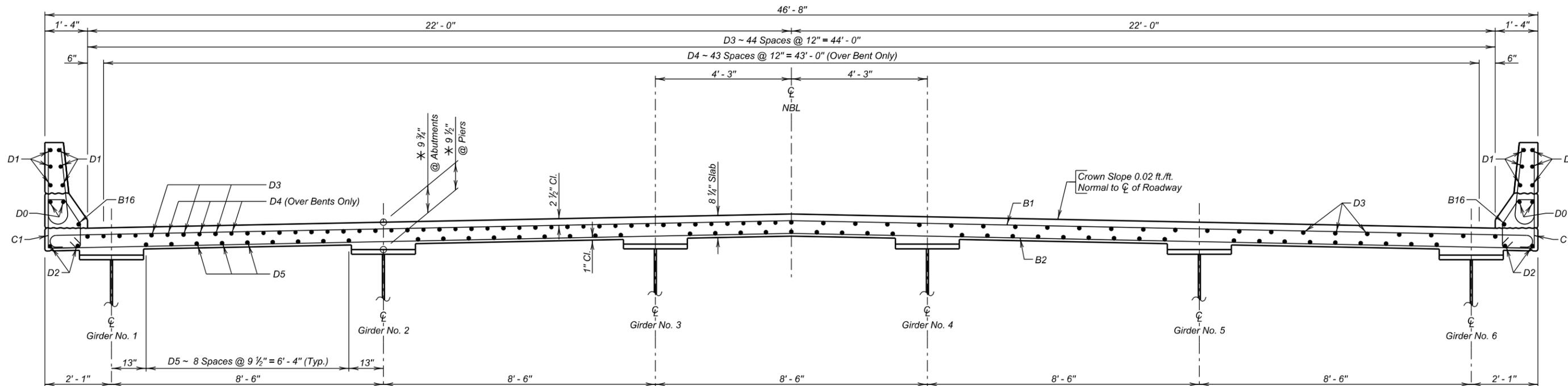
316' - 5 3/4" CONT. COMP. GIRDER BRIDGE

STR. NO. 42-067-006

APRIL 2015

5 OF 32

Revised 11/25/15 SJ



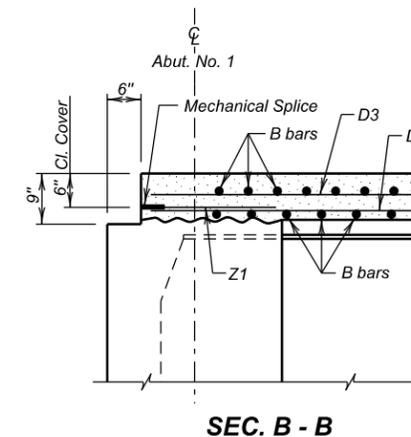
SEC. C - C

REINFORCING SCHEDULE

Mk.	No.	Size	Length	Type
B1	680	5	47'-6"	1
B2	567	4	46'-4"	Str.
B3	66	5	51'-7"	1
B4	58	4	50'-1"	Str.
B15	12	5	14'-6"	Str.
B16	12	4	56'-9"	Str.
B17	8	4	8'-6"	19B
B18	12	8	4'-3"	19B
B19	12	5	4'-2"	Str.
C1	658	5	5'-7"	T1A
C2	630	5	5'-1"	S11
C3	4	5	5'-0"	S11
C4	4	5	5'-0"	S11
C5	4	5	5'-0"	S11
C6	4	5	6'-8"	T1
C7	4	5	6'-9"	T1
C8	4	5	6'-11"	T1
C9	4	5	7'-0"	T1
C10	16	6	5'-9"	T1A
C11	16	5	7'-1"	T1
C12	4	6	5'-6"	17
C13	4	5	5'-4"	17
D0	24	4	58'-9"	Str.
D1	72	4	54'-10"	Str.
D2	24	5	58'-2"	Str.
D3	270	5	54'-0"	Str.
D4	132	6	55'-10"	Str.
D5	270	5	54'-5"	Str.
Z1	118	7	2'-0"	Str.

* Dimensions are at \bar{C} bearing; at other points along the girders this dimension shall be computed as shown on the SLAB FORM ELEVATIONS & ERECTION DATA sheets.

NOTE:
Barrier curb details are shown on END BLOCK AND BARRIER CURB DETAILS sheet.



SEC. B - B

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
★ Class A45 Concrete, Bridge Deck	Cu. Yd.	435.0
△ Structural Steel	Lump Sum	Lump Sum
No. 7 Rebar Splice	Each	118
☆ Bridge Painting	Lump Sum	Lump Sum
Concrete Penetrating Sealer	Sq. Yd.	1541
Grooving Bridge Deck	Sq. Yd.	1471.3

ALTERNATE A		
ITEM	UNIT	QUANTITY
Stainless Reinforcing Steel	Lb.	112378

ALTERNATE B		
ITEM	UNIT	QUANTITY
Zinc and Dual Coated Reinforcing Steel	Lb.	112378

SUPERSTRUCTURE DETAILS (C)

FOR

NORTHBOUND LANES

316' - 5 3/4" CONT. COMP. GIRDER BRIDGE

44' - 0" ROADWAY

33° RHF SKEW

OVER I-229

SEC. 7-T100N-R50W

STA. 118 + 55.53 TO 121 + 72.01

IM 0293(96)73

STR. NO. 42-067-006

HL-93

LINCOLN COUNTY

S. D. DEPT. OF TRANSPORTATION

APRIL 2015

16 OF 32

NOTES-
 See cutting diagram.
 Tip bars as required to maintain top and bottom clear cover.
 All dimensions are out to out of bars.

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0293(96)73	E110	E127

Revised 11/25/15 SJ

REINFORCING SCHEDULE					Bending Details				
(For Two Approach Slabs and Two Sleeper Slabs)									
Mk.	No.	Size	Length	Type					
Approach Slabs									
e1	6	4	45'-7"	Str.	<p>Type T2</p>				
e2	16	4	44'-7"	Str.					
e3	11	4	62'-11"	Str.					
e4	7	4	19'-5"	Str.					
e5	10	6	45'-7"	Str.					
e6	22	6	44'-7"	Str.					
e7	17	6	62'-10"	Str.					
e8	10	6	19'-5"	Str.					
g1	2	4	4'-0"	Str.					
g2	2	4	32'-11"	Str.					
g3	29	4	59'-5"	Str.	<p>Type 2</p>				
g4	4	8	32'-11"	Str.					
g5	4	8	4'-0"	Str.					
g6	88	8	59'-5"	Str.					
g7	56	4	6'-0"	Str.					
h1	4	6	52'-1"	Str.					
Z1	118	7	2'-0"	Str.					
Sleeper Slabs									
c1	48	5	45'-7"	Str.			15'-7"	43'-10"	g6
d1	184	4	7'-9"	2			16'-1"	43'-4"	g3
d2	92	4	6'-9"	T2	2'-9"	16'-8"	e8		
					19'-1"	43'-9"	e7		
					2'-9"	16'-8"	e4		
					19'-11"	43'-0"	e3		
					43'-0"	19'-11"	e3		
					16'-8"	2'-9"	e4		
					43'-9"	19'-1"	e7		
					16'-8"	2'-9"	e8		
					43'-4"	16'-1"	g3		
					43'-10"	15'-7"	g6		

NOTE - All bars to be Epoxy Coated. All dimensions are out to out of bars. See cutting diagram.

ESTIMATED QUANTITIES		
(For Two Approach Slabs & Two Sleeper Slabs)		
ITEM	UNIT	QUANTITY
Concrete Approach Slab for Bridge	Sq. Yd.	310.0
Concrete Approach Sleeper Slab for Bridge	Sq. Yd.	73.9
Grooving Bridge Deck	Sq. Yd.	297.2

- 81.0 Cu. Yds. Concrete in Approach Slabs.
- 21841 Lbs. Epoxy coated Re-Steel in Approach Slabs.
- 25.4 Cu. Yds. Concrete in Sleeper Slabs.
- 3650 Lbs. Epoxy coated Re-Steel in Sleeper Slab.
- 53.5 Sq. Ft. of 2" Polystyrene Insulation Board
- 49 Ft. of Membrane Sealant adjacent to wings.

Items 1 thru 6 are approximate quantities contained in the above bid items and are for information only.

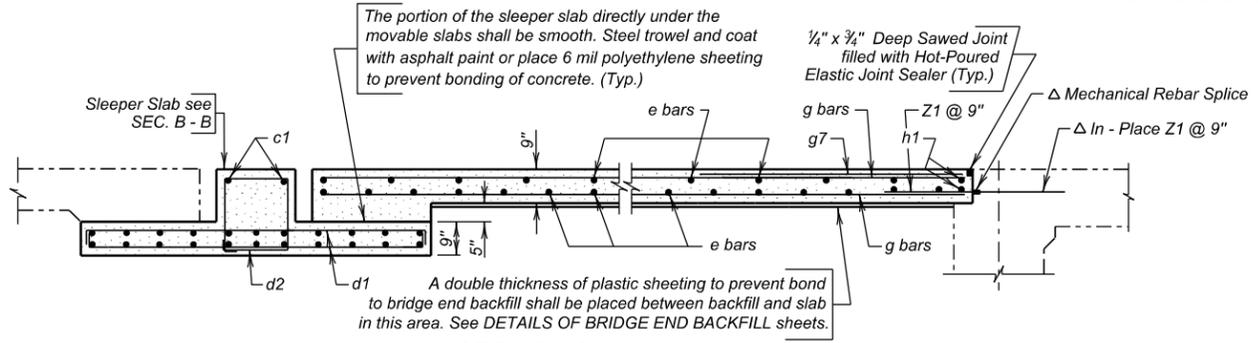
DETAILS OF APPROACH SLAB ADJACENT TO BRIDGE (B)
 FOR
NORTHBOUND LANES
316' - 5 3/4" CONT. COMP. GIRDER BRIDGE
 44' - 0" ROADWAY
 OVER I-229
 STA. 118 + 55.53 TO 121 + 72.01
 STR. NO. 42-067-006

33° RHF SKEW
 SEC. 7-T100N-R50W
 IM 0293(96)73
 HL-93

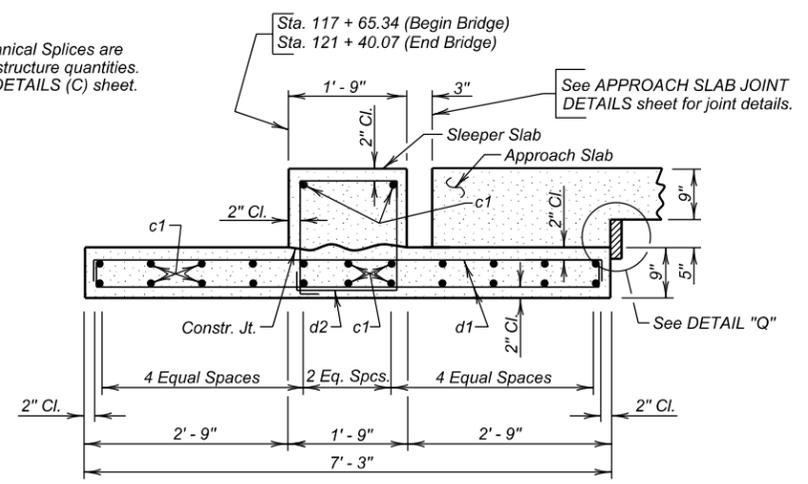
LINCOLN COUNTY
 S. D. DEPT. OF TRANSPORTATION
 APRIL 2015

DESIGNED BY PW LINC01QS	CK. DES. BY DM 01QSGA27	DRAFTED BY MG	Kevin N. Goeden BRIDGE ENGINEER
-------------------------------	-------------------------------	------------------	------------------------------------

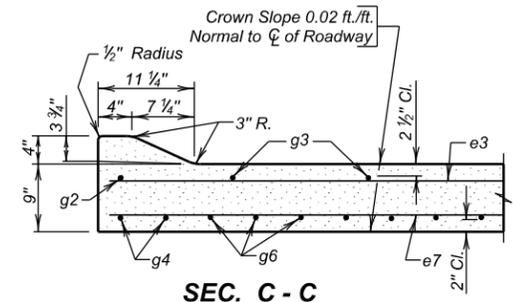
Δ In-place Z1 bars and Mechanical Splices are listed and included in superstructure quantities. See SUPERSTRUCTURE DETAILS (C) sheet.



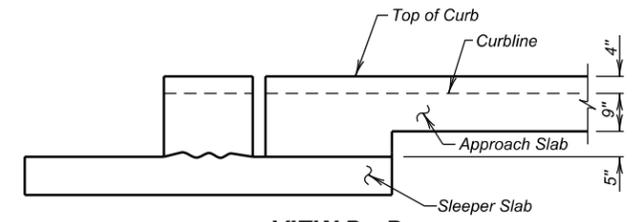
SEC. A - A



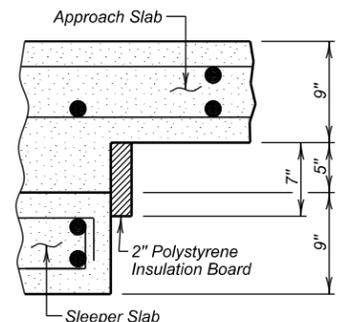
SEC. B - B
(Sleeper Slab)



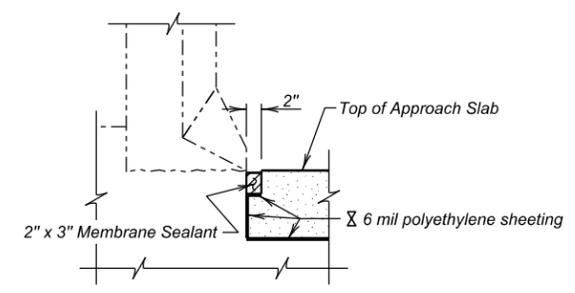
SEC. C - C



VIEW D - D

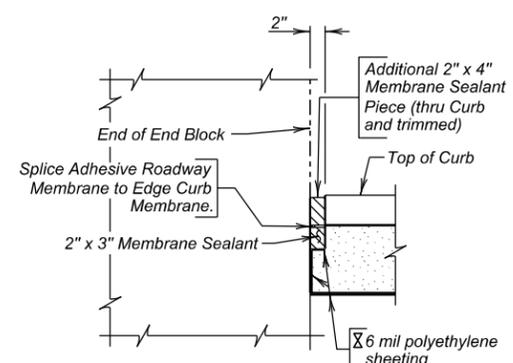


DETAIL "Q"



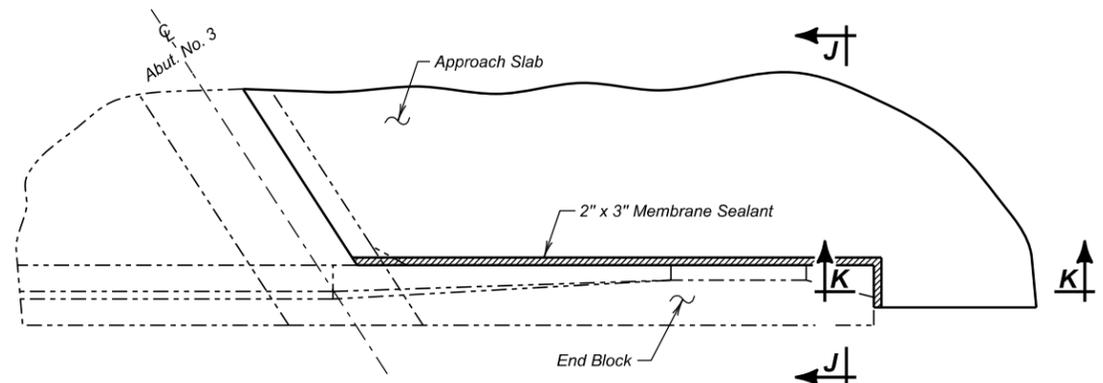
SEC. J - J

NOTE: See APPROACH SLAB JOINT DETAILS sheet for notes regarding Membrane Sealant Expansion Joint.



SEC. K - K

6 mil polyethylene sheeting shall not interfere with the bond between the Membrane Sealant and the approach slab.



DETAIL "Y"

SECTION F ESTIMATE OF QUANTITIES – PCN 01QS

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E1020	Remove Asphalt Concrete Pavement	4,499.6	CuYd
110E1640	Remove Granular Material	3,240.9	CuYd
120E6200	Water for Granular Material	1,413.3	MGal
120E9000	Pit Run	7,978.0	Ton
260E1010	Base Course	2,497.2	Ton
260E1030	Base Course, Salvaged	14,432.8	Ton
260E2010	Gravel Cushion	13,718.9	Ton
260E2030	Gravel Cushion, Salvaged	79,288.3	Ton
320E0007	PG 64-28 Asphalt Binder	496.1	Ton
320E1060	Class G Asphalt Concrete	8,783.0	Ton
320E3000	Compaction Sample	3	Each
320E4000	Hydrated Lime	86.7	Ton
330E0010	MC-70 Asphalt for Prime	0.6	Ton
330E0100	SS-1h or CSS-1h Asphalt for Tack	10.4	Ton
330E0210	SS-1h or CSS-1h Asphalt for Flush Seal	3.6	Ton
330E2000	Sand for Flush Seal	65.8	Ton
380E0120	11.5" Nonreinforced PCC Pavement	1,000.0	SqYd
380E0130	12" Nonreinforced PCC Pavement	36,213.6	SqYd
380E0150	13" Nonreinforced PCC Pavement	101,177.2	SqYd
380E0560	11" Continuously Reinforced PCC Pavement	72.0	SqYd
380E0800	PCC Shoulder Pavement	56,500.8	SqYd
380E6000	Dowel Bar	58,409	Each
380E6110	Insert Steel Bar in PCC Pavement	2,258	Each
380E6505	NGCS Grinding PCC Pavement	123,995.9	SqYd
380E6510	Grinding PCC Pavement	8,830.3	SqYd
410E2600	Membrane Sealant Expansion Joint	493.2	Ft
680E0100	Cutoff Drain	2	Each
831E0210	Non-woven Geotextile Separator	3,459	SqYd

SECTION F ESTIMATE OF QUANTITIES – PCN 020Q

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E1020	Remove Asphalt Concrete Pavement	984.2	CuYd
120E6200	Water for Granular Material	218.5	MGal
260E1010	Base Course	3,014.2	Ton
260E1030	Base Course, Salvaged	240.6	Ton
260E2010	Gravel Cushion	2,205.4	Ton
260E2030	Gravel Cushion, Salvaged	12,745.9	Ton
320E0007	PG 64-28 Asphalt Binder	106.6	Ton
320E1060	Class G Asphalt Concrete	1,886.4	Ton
320E3000	Compaction Sample	3	Each
320E4000	Hydrated Lime	18.6	Ton
330E0010	MC-70 Asphalt for Prime	0.5	Ton
330E0100	SS-1h or CSS-1h Asphalt for Tack	2.3	Ton
330E0210	SS-1h or CSS-1h Asphalt for Flush Seal	1.0	Ton
330E2000	Sand for Flush Seal	17.5	Ton
380E0130	12" Nonreinforced PCC Pavement	25,594.9	SqYd
380E0800	PCC Shoulder Pavement	8,853.3	SqYd
380E6000	Dowel Bar	11,227	Each
380E6110	Insert Steel Bar in PCC Pavement	72	Each
380E6505	NGCS Grinding PCC Pavement	19,871.0	SqYd
380E6510	Grinding PCC Pavement	1,452.4	SqYd

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0293(96)73 & IM 2292(90)0	F2	F98

Revised: 23 Nov 15, RML

SURFACING THICKNESS DIMENSIONS

Plans tonnage will be applied even though the thickness may vary from that shown on the plans.

At those locations where material must be placed to achieve a required elevation, plans tonnage may be varied to achieve the required elevation.

SAWING IN EXISTING SURFACING

Where new asphalt concrete or new PCC Pavement is placed adjacent to existing asphalt concrete or existing PCC Pavement (end of project, end of ramps, ramp detours, crossovers), the existing pavement shall be sawed full depth to a true, straight vertical face. No separate payment shall be made for sawing.

DETOURS

Detours required to construct the Phase 1 has been previously constructed during another project.

EXISTING NONREINFORCED P.C.C. PAVEMENT

The existing mainline I-229 SB and Ramp A, C & G pavement is 9.5" Nonreinforced P.C.C. Pavement. The course aggregate in the existing P.C.C. Pavement consist of Crushed Ledge Rock for I-229 SB and ramps A, C and G with 15' joint spacing.

The existing mainline I-29 NB, I-29 SB, I-229 NB and Ramp D pavement is 9" reinforced with welded wire fabric. The welded wire fabric weighs not less than 60 pounds per 100 square feet, the longitudinal wires are No. 1 gauge and spaced 6" center to center and the transverse wires are No. 4 gauge and are spaced 12" center to center. The aggregate in the existing PCC Pavement is quartzite with approximately 61.5' joint spacing.

Longitudinal joints are reinforced with No. 5 deformed bars longitudinal, spaced 30" to 48" center to center and transverse joints are reinforced with 1 ¼" plain round bars and No. 9 deformed tie bars, spaced 12" center to center.

UNCLASSIFIED EXCAVATION

Unclassified Excavation quantity shall be as noted in the following table. Unclassified Excavation will not be measured for payment and the basis of payment will be plans quantity. Unclassified Excavation is salvaged asphalt mix and granular base material and removal of waste material, see typical sections.

The Unclassified Excavation waste material may be used as Contractor Furnished Borrow Excavation for inslope flattening and widening. Stockpiling of material will be at the direction of the Engineer. The Contractor will ensure no asphalt concrete material will be used for inslope flattening and widening.

13", 12", 11.5" MAINLINE, 8" SHOULDER NONREINFORCED CONCRETE PAVEMENT and 11" CONTINUOUSLY REINFORCED PCC PAVEMENT

The fine aggregate shall be screened over a 1 inch square opening screen just prior to introduction into the concrete paving mix. The Contractor will screen all of the aggregate to prevent the incorporation of foreign materials (ie: mud balls) into the concrete mix.

The transverse contraction joints shall be perpendicular to the centerline as detailed in the standard plate for PCC Pavement Dowel Bar Assembly for Transverse Contraction Joints and special detail PCC Pavement Transverse Contraction Joint Spacing. In multilane areas the transverse contraction joints shall be perpendicular to the centerline and be in a straight line across the width of the pavement. In special situations the Engineer may pre-approve transverse contraction joints that do not meet these requirements. All nonconforming transverse contraction joints shall be removed at the Contractor's expense. Any method of placement that cannot produce these requirements shall not be allowed to continue.

There will be no direct payment for trimming of the Gravel Cushion or Gravel Cushion, Salvaged. The trimming will be considered incidental to the related items required for PCC Pavement. Trimming shall be performed as required by Section 380.3 C. of the Specifications.

Automatic dowel bar inserters will not be allowed on this project.

A construction joint will be sawed whenever new concrete pavement is placed adjacent to existing concrete pavement.

Concrete used in Portland cement concrete pavement shall conform to the Special Provision for Contractor Furnished Mix Design for PCC Pavement.

A heavy carpet drag will be required for all PCC Pavement surfaces during placement.

The concrete shall be placed with equipment operating from a preset grade line.

In addition to traditional field inspection of reinforcement, a Ground Penetrating Radar (GPR) unit may be used to verify reinforcement locations in the hardened concrete. The GPR may be used any time prior to the Acceptance of Field Work being issued. All costs related to corrective measures, including but not limited to concrete removal or cutting of reinforcement, price deducts, and delays to the project schedule shall be the responsibility of the Contractor.

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0293(96)73 & IM 2292(90)0	F6	F98

Revised: 23 Nov 15, RML

11" CONTINUOUSLY REINFORCED PCC PAVEMENT	
LOCATION	11" CONTINUOUSLY REINFORCED PCC PAVEMENT SQ.YDS.
I-29 Mainline	
Sta. 43+46 to Sta. 43+55 SBL	36.0
Sta. 43+46 to Sta. 43+55 NBL	36.0
TOTAL	72.0

13" NONREINFORCED PCC PAVEMENT	
LOCATION	13" NONREINFORCED PCC PAVEMENT SQ.YDS.
I-29 SB Mainline	
Sta. 43+50.0 to Sta. 76+34.2 SB	13,116.8
Sta. 76+34.2 to Sta. 80+38.1 SB, includes Ramp C gore area	2,803.8
Sta. 80+38.1 to Sta. 106+33.8 SB	6,921.9
Sta. 106+33.8 to Sta. 114+96.6 SB, Include Ramp G gore area	5,661.5
Sta. 114+93.6 to Sta. 117+65.0 SB	1,085.6
Sta. 121+37.5 to Sta. 172+90.3 SB	20,611.2
I-29 NB Mainline	
Sta. 43+50.0 to Sta. 95+21.3 NB	20,665.2
Sta. 95+21.3 to Sta. 108+79.1 NB, includes Ramp B gore area	8,491.5
Sta. 108+79.1 to Sta. 118+26.2 NB	2,525.6
Sta. 122+03.4 to Sta. 135+88.8 NB	3,694.4
Sta. 135+88.8 to Sta. 138+95.0 NB, Include Ramp A gore area	2,018.5
Sta. 138+95.0 to Sta. 172+90.3 NB	13,581.2
TOTAL	101,177.2

12" NONREINFORCED PCC PAVEMENT	
LOCATION	12" NONREINFORCED PCC PAVEMENT SQ.YDS.
I-29 Ramps	
Sta. 11+91.2 to Sta. 26+16.1 Ramp A	3,958.1
Sta. 22+07.7 to Sta. 41+63.8 Ramp B	6,085.6
Sta. 12+80.7 to Sta. 42+00.0 Ramp C	11,436.6
Sta. 64+00.0 to Sta. 73+57.4 Ramp C	4,042.4
Sta. 10+80.3 to Sta. 49+00.0 Ramp G	10,575.3
I-29 Mainline	
Sleeper Slab at Sta. 43+55 SBL	57.8
Sleeper Slab at Sta. 43+55 NBL	57.8
I-229 SB Mainline	
Sta. 73+57.3 to Sta. 76+77.0 SB, Include Ramp A/C gore area	2,157.5
Sta. 76+77.0 to Sta. 97+13.9 SB	8,147.6
Sta. 97+13.9 to Sta. 101+23.8 SB	2,186.1
I-229 NB Mainline	
Sta. 149+00.0 to Sta. 152+77.3 NB, includes Ramp B/G gore area	1,792.1
Sta. 152+77.3 to Sta. 181+05.2 NB	11,311.6
TOTAL	61,808.5

11.5" NONREINFORCED PCC PAVEMENT	
LOCATION	11.5" NONREINFORCED PCC PAVEMENT SQ.YDS.
I-29 Tea Interchange Mainline	
Sta. 47+84 to Sta. 48+74 SB	260.0
Sta. 51+26 to Sta. 52+16 SB	240.0
Sta. 47+84 to Sta. 48+74 NB	260.0
Sta. 51+26 to Sta. 52+16 NB	240.0
TOTAL	1,000.0

Revised: 23 Nov 15, RML

8" PCC SHOULDER PAVEMENT	
LOCATION	8" PCC SHOULDER PAVEMENT SQ.YDS.
I-29 Shoulders	
Sta. 24+85.6 to Sta. 76+34.2 I-29 SB Outside Shoulder	5,720.7
Sta. 80+38.1 to Sta. 106+33.8 I-29 SB Outside Shoulder	2,884.1
Sta. 108+53.6 to Sta. 117+65.0 I-29 SB Outside Shoulder	1,012.7
Sta. 121+37.5 to Sta. 155+95.2 I-29 SB Outside Shoulder	3,841.9
Sta. 155+95.2 to Sta. 157+75.2 I-29 SB Outside Shoulder	520.0
Sta. 157+75.2 to Sta. 172+90.3 I-29 SB Outside Shoulder	1,683.4
Sta. 43+50.0 to Sta. 117+65.0 I-29 SB Median Shoulder	8,195.5
Sta. 121+37.5 to Sta. 169+04.5 I-29 SB Median Shoulder	5,296.7
Sta. 43+50.0 to Sta. 105+75.6 I-29 NB Outside Shoulder	6,917.3
Sta. 108+79.1 to Sta. 118+26.2 I-29 NB Outside Shoulder	1,052.3
Sta. 122+03.4 to Sta. 135+88.8 I-29 NB Outside Shoulder	1,539.3
Sta. 138+95.0 to Sta. 157+06.3 I-29 NB Outside Shoulder	2,012.6
Sta. 157+06.3 to Sta. 158+96.1 I-29 NB Outside Shoulder	548.3
Sta. 158+96.1 to Sta. 172+90.3 I-29 NB Outside Shoulder	1,549.1
Sta. 43+50.0 to Sta. 118+26.2 I-29 NB Median Shoulder	8,263.5
Sta. 122+03.4 to Sta. 169+04.5 I-29 NB Median Shoulder	5,223.4
I-29 Tea Interchange Median Shoulder	
Sta. 47+84 to Sta. 48+74 SB	60.0
Sta. 51+26 to Sta. 52+16 SB	60.0
Sta. 47+84 to Sta. 48+74 NB	60.0
Sta. 51+26 to Sta. 52+16 NB	60.0
I-229 Shoulders	
Sta. 74+28.0 to Sta. 101+23.8 I-29 SB Median Shoulder	2,995.3
Sta. 76+77.0 to Sta. 97+13.9 I-29 SB Outside Shoulder	2,715.9
Sta. 152+77.3 to Sta. 181+05.2 I-29 NB Median Shoulder	3,142.1
TOTAL	65,354.1

TRANSVERSE CONTRACTION JOINTS

See PCC Pavement Layouts sheets and standard plate for PCC Pavement Transverse Contraction Joint Spacing for joint spacing in Nonreinforced PCC Pavement.

TABLE OF DOWEL BARS

Location	1 1/2" Bars Each
I-29 Mainline	
Sta. 43+50.0 to Sta. 172+90.3 SB	21,024
Sta. 43+50.0 to Sta. 172+90.3 NB	21,222
I-29 Ramp Gore Areas	
Ramp A	375
Ramp B	580
Ramp C	498
Ramp G	378
Ramps	
Ramp A	1,775
Ramp B	2,744
Ramp C	4,694
Ramp G	4,735
I-29 Tea Interchange Mainline	
Sta. 47+84 to Sta. 48+74 SB	96
Sta. 51+26 to Sta. 52+16 SB	96
Sta. 47+84 to Sta. 48+74 NB	96
Sta. 51+26 to Sta. 52+16 NB	96
I-229 Mainline	
Sta. 76+77.0 to Sta. 101+23.8 SB	4,392
Sta. 152+77.3 to Sta. 181+05.2 NB	5,076
I-229 Ramp Gore Areas	
Ramp A/C	988
Ramp B/G	771
TOTAL	69,636

LOCATION OF CONCRETE PAVEMENT JOINTS

The location of joints, as shown on the "PCC Pavement Layout" sheets, are only approximate locations to be used as a guide in the final location of joints and to afford bidders a basis for estimating the construction costs of the joints. The final locations of the joints are to be designated by the Engineer during construction.

TINING

No tining will be allowed on this project. All PCC Pavement will receive a heavy carpet drag.

CONCRETE CORING FOR PAVEMENT THICKNESS

The Department will sample the concrete cores for determining pavement thickness, in accordance with Section 380.3 R, prior to the Contractor beginning the Next Generation Concrete Surface grinding.

STEEL BAR INSTALLATION

The Contractor shall install the Steel Bars (1 1/4 inch x 18 inch epoxy coated plain round dowel bar and No. 5 x 24 inch epoxy coated deformed tie bar) into drilled holes in the existing concrete pavement.

The steel bars shall be cut to the specified length by sawing and shall be free from burring or other deformations. Shearing will not be permitted.

Epoxy coated plain round steel bars shall be installed on 12 inch centers in the transverse joint. The first steel bar shall be placed a minimum of 3 inches and a maximum of 6 inches from the outside edge of the slab.

Epoxy coated deformed steel bars adjacent to Nonreinforced PCC Pavement shall be inserted on 30 inch centers in the longitudinal joint and shall be placed a minimum of 15 inches from the existing transverse contraction joint.

Epoxy coated deformed steel bars adjacent Continuously Reinforced PCC Pavement shall be inserted on 15 inch centers in the longitudinal joint and shall be placed a minimum of 7.5 inches from the existing transverse contraction joint.

Cost for the epoxy resin adhesive, steel bars, drilling of holes, applying the adhesive, installing the steel bars into the drilled holes and all other items incidental to the installation of the steel bars shall be incidental to the contract unit price per each for Insert Steel Bar in PCC Pavement.

TABLE OF STEEL BAR INSTALLATION

LOCATION*	No. 5 x 24" Deformed Tie Bar	1-1/4" x 18" Plain Round Dowel Bars
	each	each
I-29		
Sta. 24+85.6 to Sta. 43+46.0 Lt. SB (15" C-C)	1,492	
Sta. 169+04.5 to Sta. 172+90.3 Rt. SB (30" C-C)	309	
Sta. 172+90.3 SB (12" C-C)		36
Sta. 169+04.5 to Sta. 172+90.3 Lt. NB (30" C-C)	309	
Sta. 172+90.3 NB (12" C-C)		36
RAMPS		
Sta. 42+00.0 Ramp C (12" C-C)		38
Sta. 64+00.0 Ramp C (12" C-C)		38
I-229		
Sta. 101+23.8 SB (12" C-C)		36
Sta. 181+05.2 NB (12" C-C)		36
Subtotal	2,110	220
TOTAL		2,330

NGCS GRINDING PCC PAVEMENT

NGCS grinding of PCC Pavement will be accomplished according to the Special Provision for NGCS Grinding PCC Pavement. All costs to grind mainline shall be incidental to the contract unit price per square yard for NGCS Grinding PCC Pavement.

Shoulder grinding shall transition from the edge of the mainline and other lanes requiring NGCS grinding as required to provide drainage and an acceptable riding surface. Adequate cross slope drainage shall be maintained. The Contractor shall use conventional diamond grinding in accordance with Section 380.3 O to feather PCC Pavement adjacent to NGCS grinding areas. Costs to feather grind shoulder areas adjacent to NGCS grinding shall be incidental to the contract unit price per square yard for Grinding PCC Pavement.

TABLE OF NGCS and Shoulder Grinding PCC Pavement

						NGCS Grinding PCCP	Shoulder Grinding PCCP
						sq. yds.	sq. yds.
Station		Station					
I29 SB Mainline							
43	+	46.0	to	76	+	15.2	
76	+	15.2	to	106	+	33.8	
76	+	15.2	to	80	+	38.1	Ramp C gore
106	+	33.8	to	108	+	53.6	
106	+	33.8	to	108	+	53.6	Ramp G gore
108	+	53.6	to	112	+	53.6	
112	+	53.6	to	114	+	93.6	
114	+	93.6	to	117	+	65.4	
121	+	39.9	to	172	+	90.3	
I29 NB Mainline							
43	+	46.0	to	95	+	21.3	
95	+	21.3	to	105	+	47.0	
105	+	47.0	to	118	+	24.0	
122	+	03.5	to	138	+	95.0	
105	+	47.0	to	108	+	79.1	Ramp B gore
135	+	88.8	to	138	+	95.0	Ramp A gore
138	+	95.0	to	172	+	90.3	
I229 SB Mainline							
73	+	57.4	to	76	+	77.0	
8	+	70.2	to	11	+	91.2	Ramp A gore
76	+	77.0	to	97	+	13.9	
97	+	13.9	to	101	+	28.8	
I229 NB Mainline							
149	+	69.4	to	152	+	77.3	
41	+	38.4	to	44	+	46.5	Ramp B gore
152	+	77.3	to	154	+	28.8	
154	+	28.8	to	179	+	55.2	
179	+	55.2	to	181	+	05.2	
Ramps							
11	+	91.2	to	26	+	16.1	Ramp A
22	+	07.7	to	41	+	38.4	Ramp B
12	+	80.7	to	19	+	40.0	Ramp C
19	+	40.0	to	25	+	22.1	Ramp C
25	+	22.1	to	73	+	57.4	Ramp C
10	+	80.3	to	39	+	00.0	Ramp G
39	+	00.0	to	40	+	20.0	Ramp G
40	+	20.0	to	46	+	90.0	Ramp G
46	+	90.0	to	49	+	00.0	Ramp G
49	+	00.0	to	49	+	69.4	Ramp G
						143,866.9	10,282.7

GENERAL ROADWAY FEATURES

Station						Length feet	Curve Radius feet		
I29 NB/SB Mainline									
43	+	46.00	to	49	+	15.40	569.4	Straight	
49	+	15.40	to	61	+	06.50	1191.1	25,000	
61	+	06.50	to	80	+	24.30	1917.8	Straight	
80	+	25.30	to	95	+	21.60	1496.3	5,729	
95	+	21.60	to	125	+	44.90	3023.3	Straight	
125	+	44.90	to	135	+	41.30	996.4	5,760	
135	+	41.30	to	172	+	90.30	3749.0	Straight	
I229 NB Mainline									
149	+	69.40	to	162	+	89.70	1320.3	Straight	
162	+	89.70	to	178	+	15.10	1525.4	20,000	
178	+	15.10	to	181	+	05.20	290.1	Straight	
I229 SB Mainline									
73	+	57.40	to	85	+	54.30	1196.9	14,200	
85	+	54.30	to	101	+	28.80	1574.5	Straight	
Ramps									
10	+	20.30	to	11	+	91.20	Ramp A -I229 Gore Area	170.9	768
11	+	91.20	to	26	+	16.10	Ramp A	1424.9	768
26	+	16.10	to	27	+	72.90	Ramp A I-29 Gore Area	156.8	768
18	+	75.20	to	22	+	07.70	Ramp B I-29 Gore Area	332.5	2,500
22	+	07.70	to	41	+	38.40	Ramp B	1930.7	2,500
41	+	38.40	to	44	+	46.50	Ramp B I-229 Gore Area	308.1	2,500
10	+	07.60	to	12	+	80.70	Ramp C I-29 Gore Area	273.1	2,075
12	+	80.70	to	16	+	44.00	Ramp C	363.3	2,075
16	+	44.00	to	28	+	11.80	Ramp C	1167.8	Straight
28	+	11.80	to	56	+	96.60	Ramp C	2884.8	1,898
56	+	96.60	to	63	+	82.30	Ramp C	685.7	Straight
63	+	82.30	to	73	+	57.40	Ramp C	975.1	14,200
10	+	00.00	to	10	+	80.30	Ramp G I-29 Gore Area	80.3	400
10	+	80.30	to	23	+	57.80	Ramp G	1277.5	400
23	+	57.80	to	37	+	82.00	Ramp G	1424.2	1,836
37	+	82.00	to	49	+	69.40	Ramp G	1187.4	Straight

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0293(96)73 & IM 2292(90)0	F7A	F98

Revised: 23 Nov 15, RML

NGCS GRINDING PCCP LAYOUT

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0293(96)73 & IM 2292(90)0	F48A	F98

Plotting Date: 11/25/2015

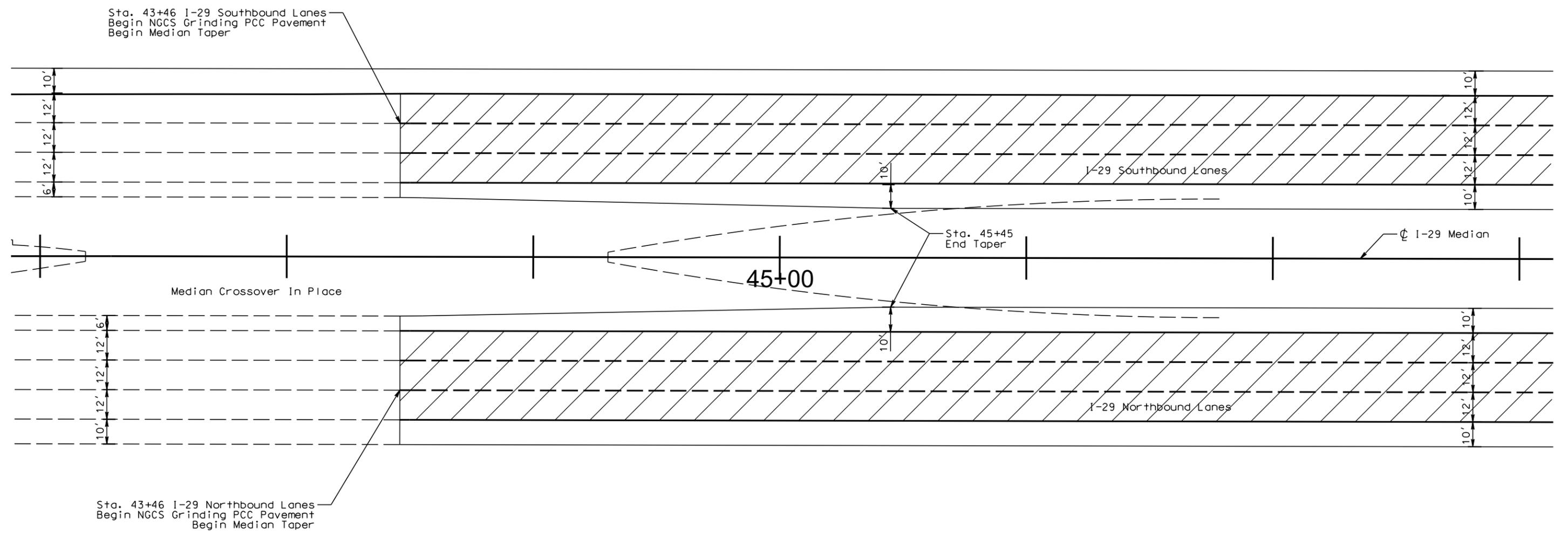
Scale 1 Inch = 40 Feet
Sheet 1 of 12 Sheets

Revised: 23 Nov 15, RML



PLOT SCALE - 1:40

PLOT NAME - 38



PLOTTED FROM - IRPR16032

FILE - ... NGCS GRINDING LAYOUT.DGN

NGCS GRINDING PCCP LAYOUT

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0293(96)73 & IM 2292(90)0	F48B	F98

Plotting Date: 11/25/2015

Revised: 23 Nov 15, RML

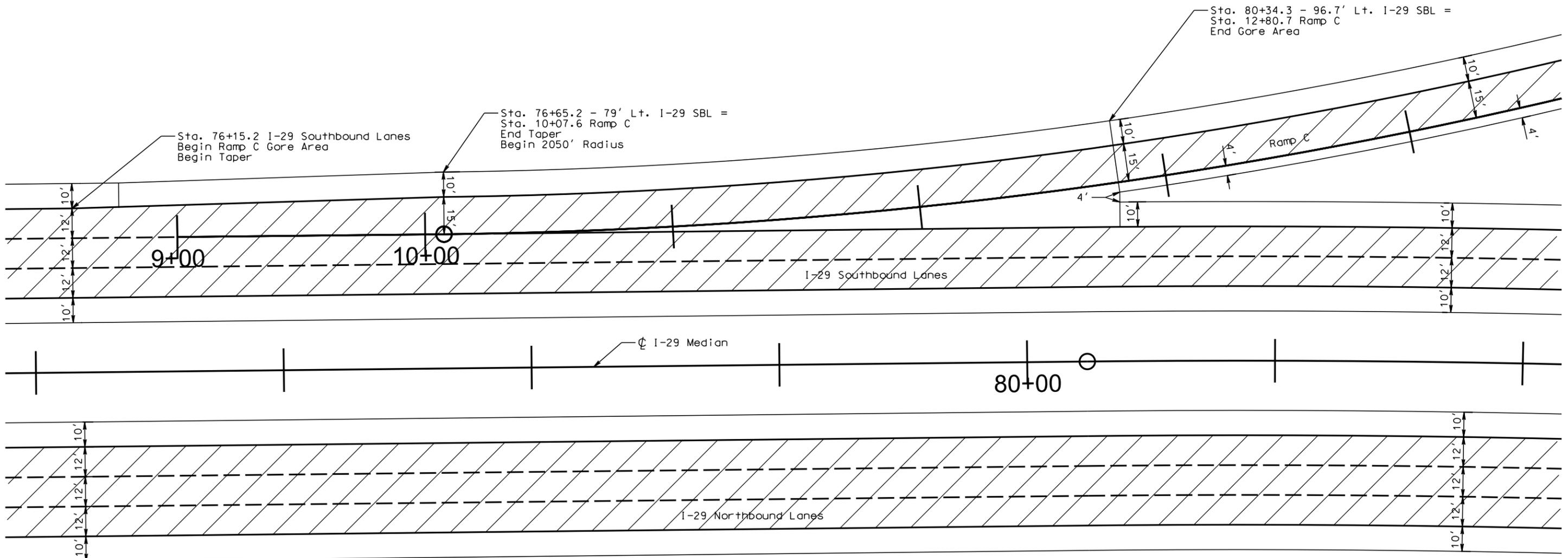
Scale 1 Inch = 40 Feet
Sheet 2 of 12 Sheets

 NGCS Grinding PCC Pavement



PLOT SCALE - 1:40

PLOT NAME - 39



PLOTTED FROM - TRPR16032

FILE - ... NGCS GRINDING LAYOUT.DGN

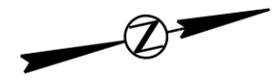
NGCS GRINDING PCCP LAYOUT

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0293(96)73 & IM 2292(90)0	F48C	F98

Plotting Date: 11/25/2015

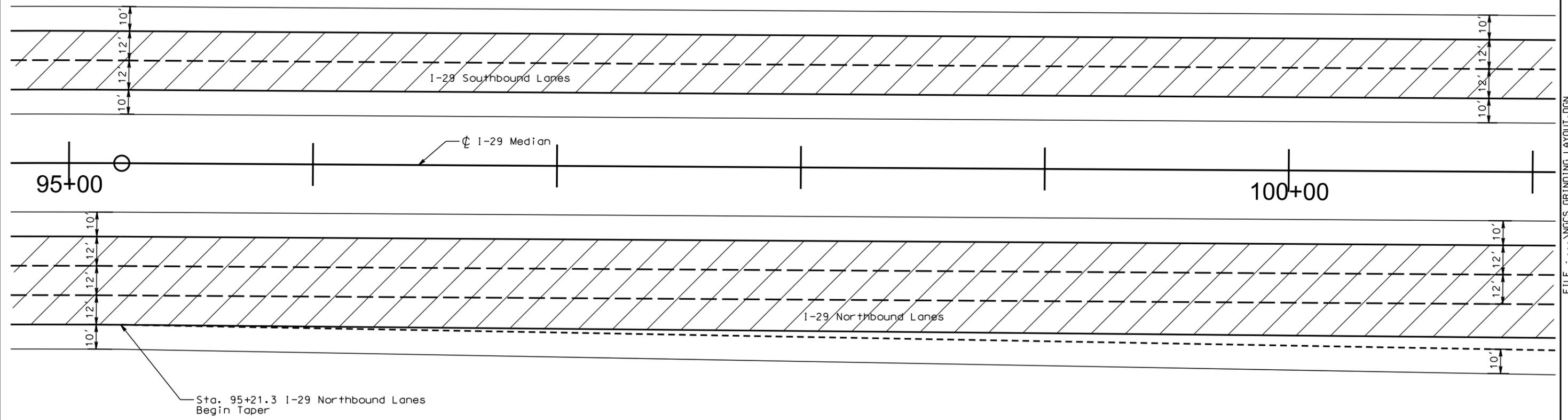
Revised: 23 Nov 15, RML

Scale 1 Inch = 40 Feet
Sheet 3 of 12 Sheets



PLOT SCALE - 1:40

PLOT NAME - 40



PLOTTED FROM - IRPR16032

FILE - ... \NGCS GRINDING LAYOUT.DGN

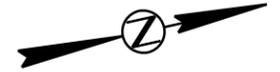
NGCS GRINDING PCCP LAYOUT

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0293(96)73 & IM 2292(90)0	F48D	F98

Plotting Date: 11/25/2015

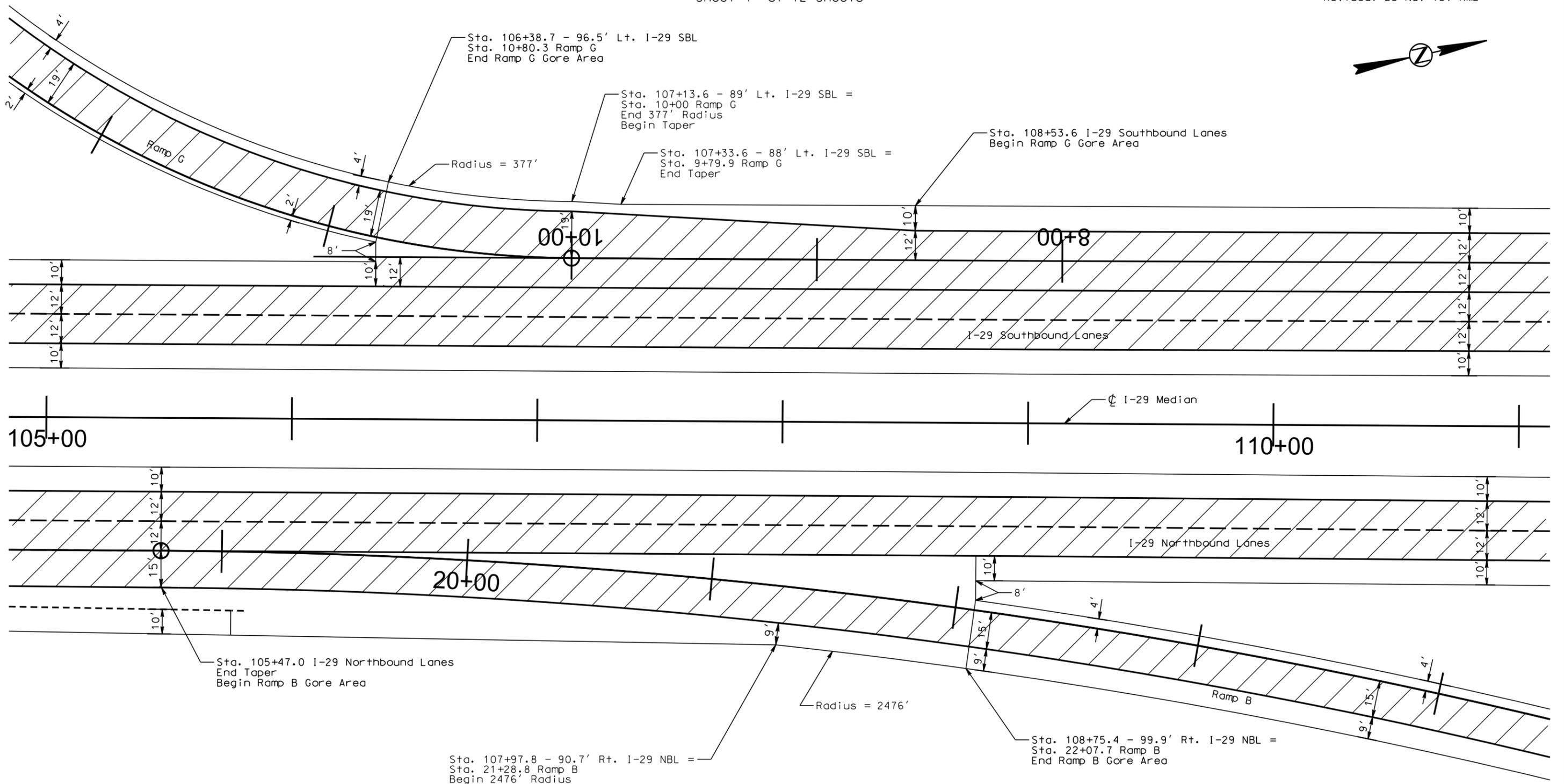
Revised: 23 Nov 15, RML

Scale 1 Inch = 40 Feet
Sheet 4 of 12 Sheets



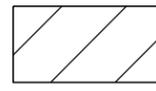
PLOT SCALE - 1:40

PLOT NAME - 41



PLOTTED FROM - TRPR16032

FILE - ...NGCS GRINDING LAYOUT.DGN

 NGCS Grinding PCC Pavement

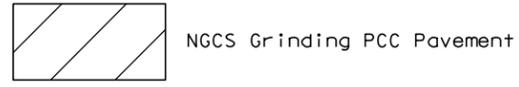
NGCS GRINDING PCCP LAYOUT

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0293(96)73 & IM 2292(90)0	F48E	F98

Plotting Date: 11/25/2015

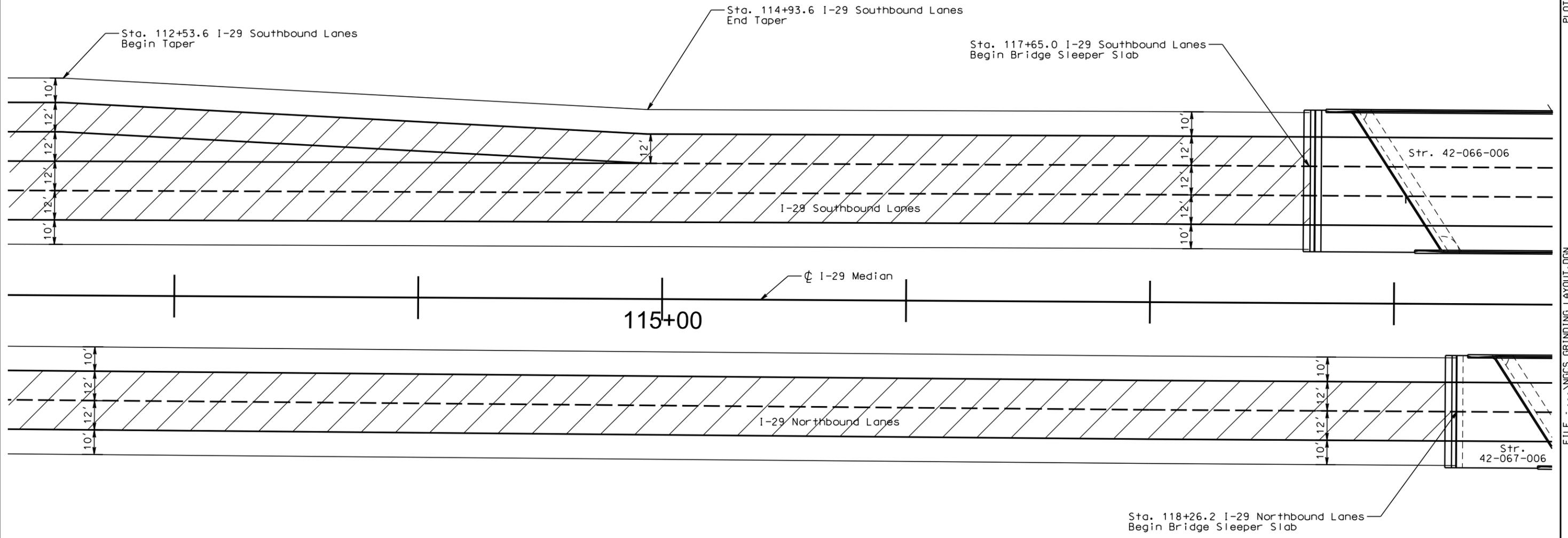
Revised: 23 Nov 15, RML

Scale 1 Inch = 40 Feet
Sheet 5 of 12 Sheets



PLOT SCALE - 1:40

PLOT NAME - 42



PLOTTED FROM - IRPR16032

FILE - ...NGCS GRINDING LAYOUT.DGN

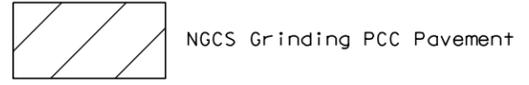
NGCS GRINDING PCCP LAYOUT

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0293(96)73 & IM 2292(90)0	F48F	F98

Plotting Date: 11/25/2015

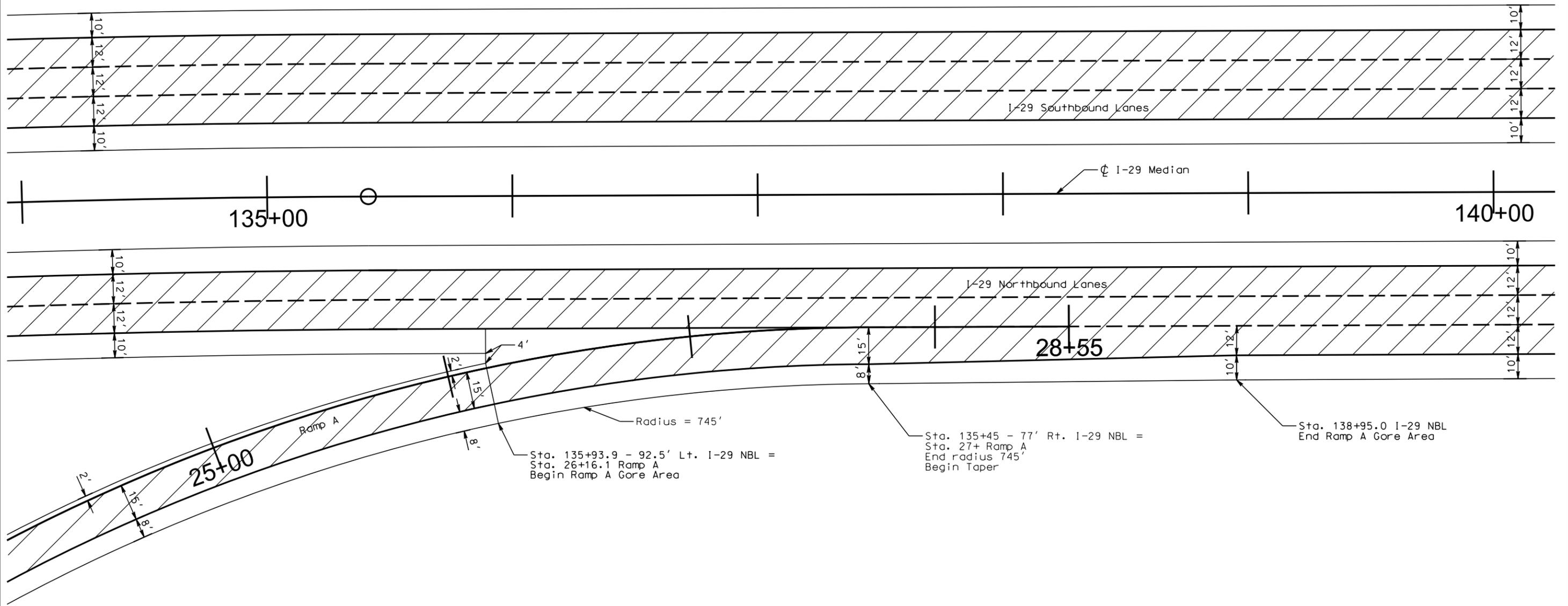
Revised: 23 Nov 15, RML

Scale 1 Inch = 40 Feet
Sheet 6 of 12 Sheets



PLOT SCALE - 1:40

PLOT NAME - 43



Sta. 135+93.9 - 92.5' Lt. I-29 NBL =
Sta. 26+16.1 Ramp A
Begin Ramp A Gore Area

Sta. 135+45 - 77' Rt. I-29 NBL =
Sta. 27+ Ramp A
End radius 745'
Begin Taper

Sta. 138+95.0 I-29 NBL
End Ramp A Gore Area

PLOTTED FROM - IRPR16032

FILE - ... \NGCS GRINDING LAYOUT.DGN

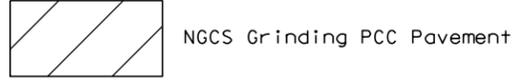
NGCS GRINDING PCCP LAYOUT

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0293(96)73 & IM 2292(90)0	F48G	F98

Plotting Date: 11/25/2015

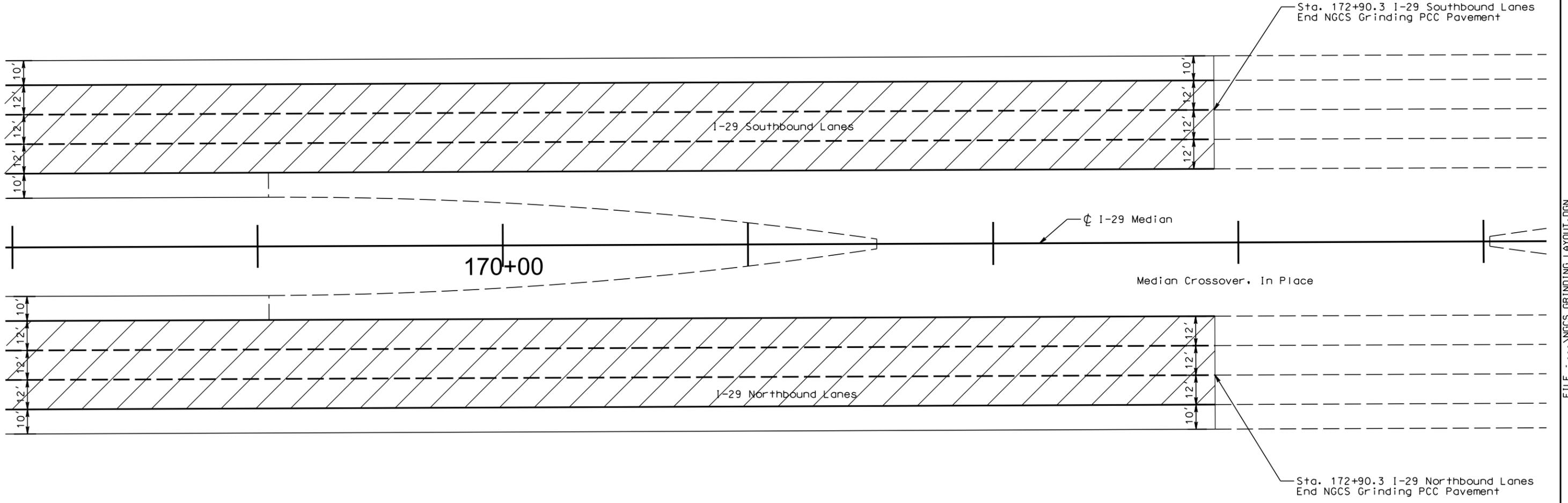
Revised: 23 Nov 15, RML

Scale 1 Inch = 40 Feet
Sheet 7 of 12 Sheets



PLOT SCALE - 1:40

PLOT NAME - 44



PLOTTED FROM - IRPR16032

FILE - ... NGCS GRINDING LAYOUT.DGN

NGCS GRINDING PCCP LAYOUT

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0293(96)73 & IM 2292(90)0	F48H	F98

Plotting Date: 11/25/2015

Revised: 23 Nov 15, RML

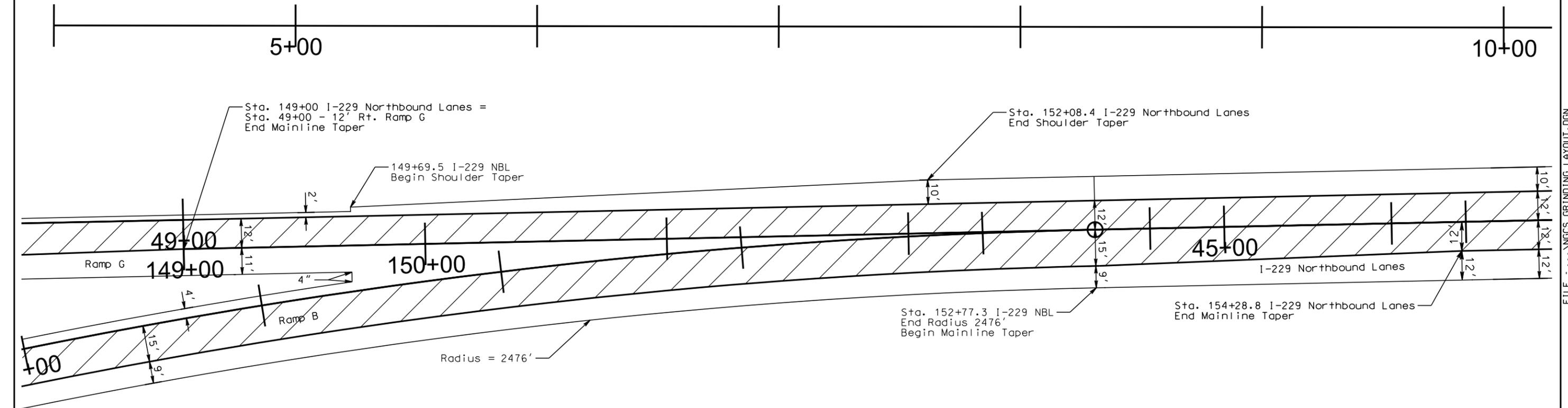
Scale 1 Inch = 40 Feet
Sheet 8 of 12 Sheets



PLOT SCALE - 1:40

PLOT NAME - 45

FILE - ... NGCS GRINDING LAYOUT.DGN



PLOTTED FROM - TRPR16032

NGCS GRINDING PCCP LAYOUT

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0293(96)73 & IM 2292(90)0	F481	F98

Plotting Date: 11/25/2015

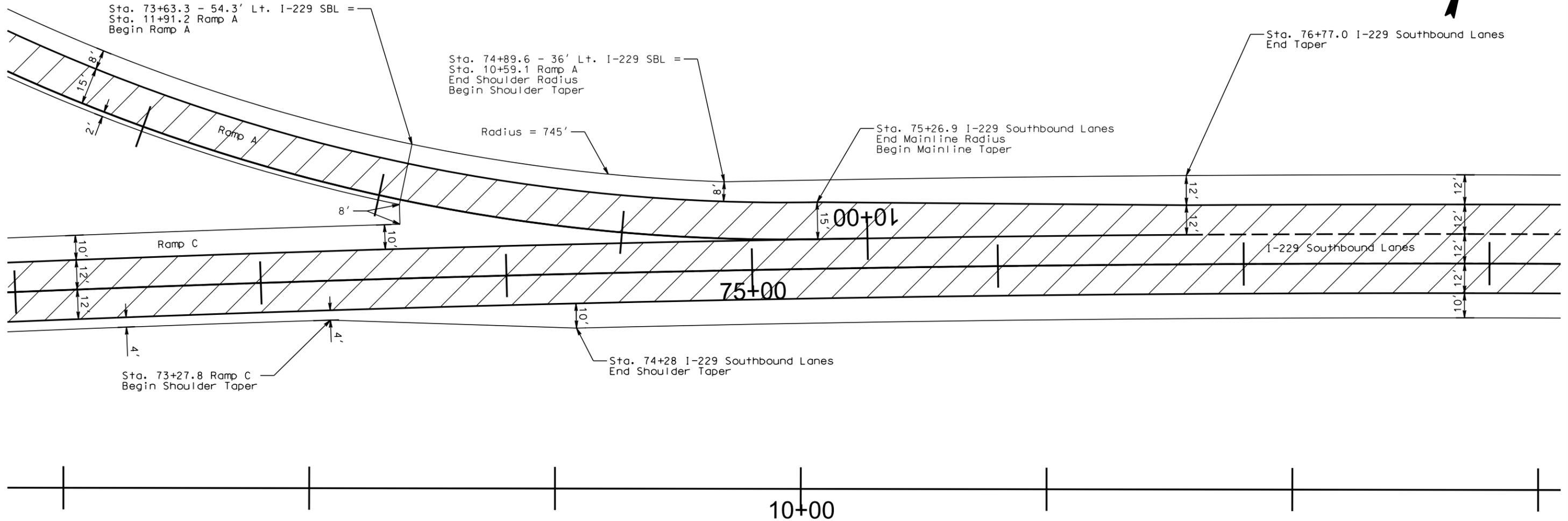
Revised: 23 Nov 15, RML

Scale 1 Inch = 40 Feet
Sheet 9 of 12 Sheets



PLOT SCALE - 1:40

PLOT NAME - 46



PLOTTED FROM - TRPR16032

FILE - ... \NGCS GRINDING LAYOUT.DGN

NGCS GRINDING PCCP LAYOUT

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0293(96)73 & IM 2292(90)0	F48J	F98

Plotting Date: 11/25/2015

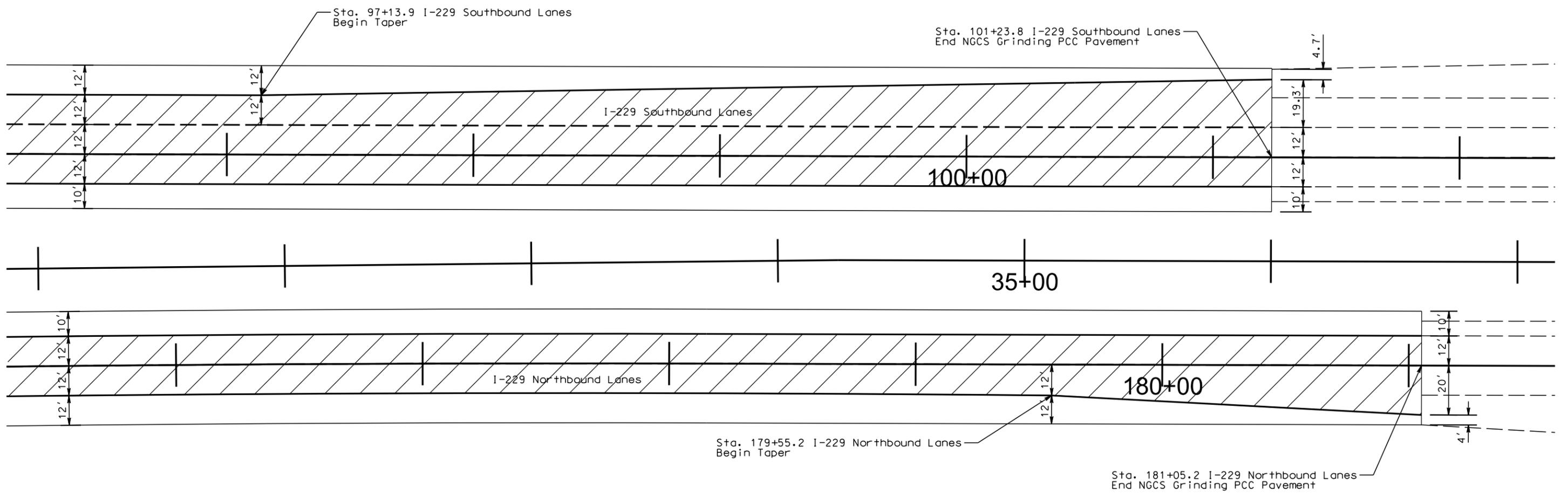
Revised: 23 Nov 15, RML

Scale 1 Inch = 40 Feet
Sheet 10 of 12 Sheets



PLOT SCALE - 1:40

PLOT NAME - 47



PLOTTED FROM - IRPR16032

FILE - ... NGCS GRINDING LAYOUT.DGN

NGCS GRINDING PCCP LAYOUT

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0293(96)73 & IM 2292(90)0	F48K	F98

Plotting Date: 11/25/2015

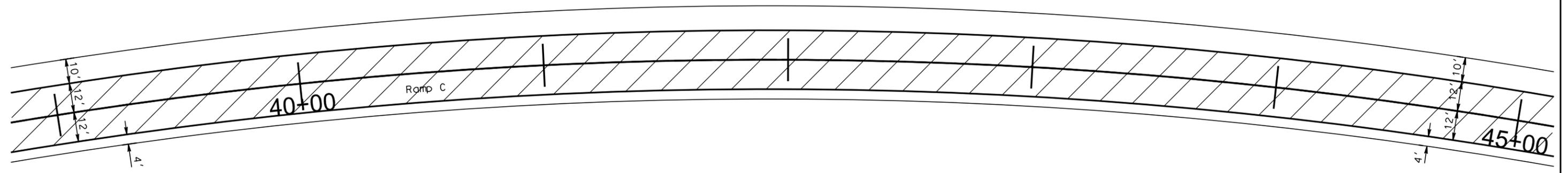
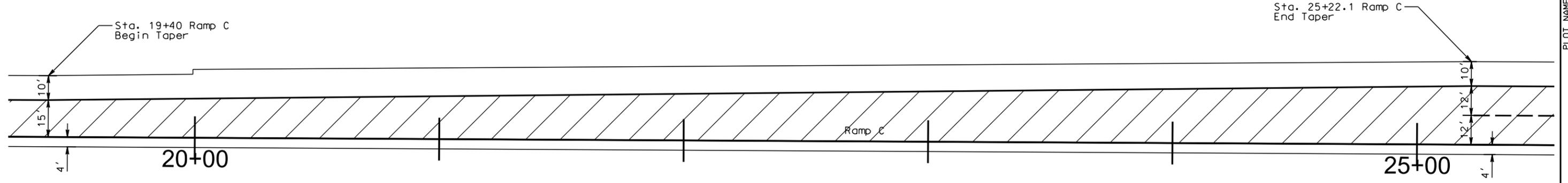
Revised: 23 Nov 15, RML

Scale 1 Inch = 40 Feet
Sheet 11 of 12 Sheets



PLOT SCALE - 1:40

PLOT NAME - 48



PLOTTED FROM - IRPR16032

FILE - ... \NGCS GRINDING LAYOUT.DGN

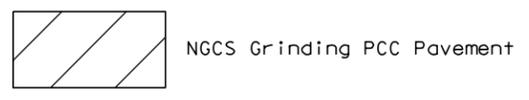
NGCS GRINDING PCCP LAYOUT

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0293(96)73 & IM 2292(90)0	F48L	F98

Plotting Date: 11/25/2015

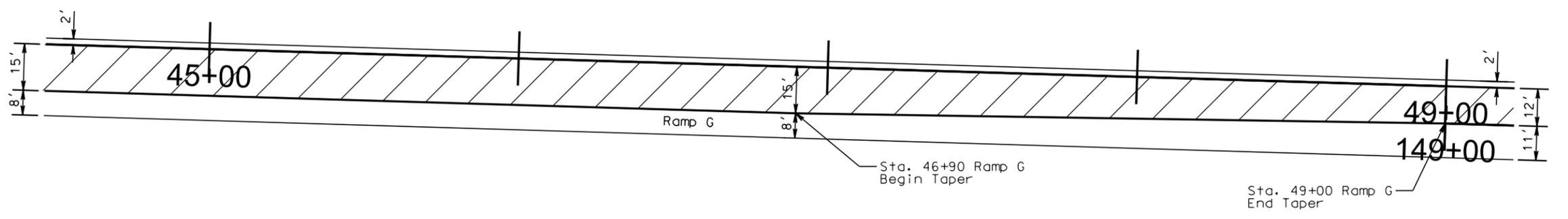
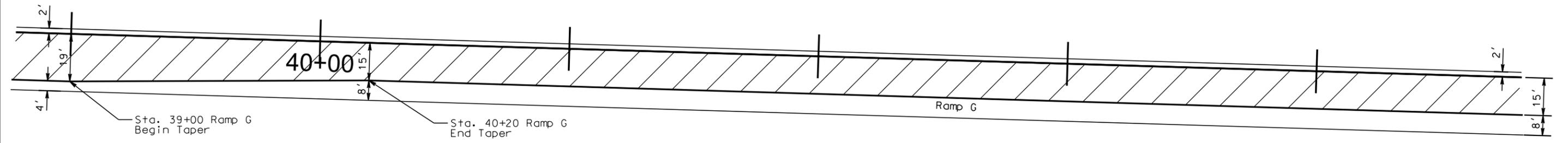
Revised: 23 Nov 15. RML

Scale 1 Inch = 40 Feet
Sheet 12 of 12 Sheets



PLOT SCALE - 1:40

PLOT NAME - 49



PLOTTED FROM - IRPR16032

FILE - ... \NGCS GRINDING LAYOUT.DGN

SECTION S ESTIMATE OF QUANTITIES (01QS)

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E0120	Remove Sign Bridge	3	Each
110E0130	Remove Traffic Sign	81	Each
110E7150	Remove Sign for Reset	7	Each
250E0010	Incidental Work	Lump Sum	LS
632E0010	1.25' Diameter Breakaway Support Concrete Footing	84.0	Ft
632E0012	1.5' Diameter Breakaway Support Concrete Footing	8.0	Ft
632E0014	1.75' Diameter Breakaway Support Concrete Footing	164.0	Ft
632E0058	2.25' Diameter Fixed Support Concrete Footing	102.0	Ft
632E0060	2.5' Diameter Fixed Support Concrete Footing	24.0	Ft
632E1225	W6x12 Steel Post	54.0	Ft
632E1235	W6x20 Steel Post	129.7	Ft
632E1240	W8x18 Steel Post	38.2	Ft
632E1245	W8x21 Steel Post	229.9	Ft
632E1255	W8x28 Steel Post	134.4	Ft
632E1260	W8x31 Steel Post	47.2	Ft
632E1320	2.0"x2.0" Perforated Tube Post	241.9	Ft
632E1410	3" Diameter Steel Post, .216" Shell	38.1	Ft
632E1415	4" Diameter Steel Post, .237" Shell	248.4	Ft
632E2000	4"x4" Amber Delineator with 1.12 Lb/Ft Post	144	Each
632E2004	4"x8" Amber Delineator with 1.12 Lb/Ft Post	15	Each
632E2020	4"x4" White Delineator with 1.12 Lb/Ft Post	193	Each
632E2024	4"x8" White Delineator with 1.12 Lb/Ft Post	37	Each
632E2220	Guardrail Delineator	18	Each
632E2520	Type 2 Object Marker	15	Each
632E3105	Extruded Aluminum Sign, Removable Copy Super/Very High Intensity	5,190.8	SqFt
632E3203	Flat Aluminum Sign, Nonremovable Copy High Intensity	239.0	SqFt
632E3205	Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity	321.0	SqFt
632E3500	Reset Sign	7	Each
632E5010	Double Beam Sign Bridge	5	Each
632E5020	Overhead Cantilever Sign Support	3	Each
635E5302	Type 2 Electrical Junction Box	3	Each
635E8120	2" Rigid Conduit, Schedule 40	1,000	Ft
635E8220	2" Rigid Conduit, Schedule 80	75	Ft
635E9020	1/C #10 AWG Copper Wire	3,538	Ft

SECTION S ESTIMATE OF QUANTITIES (020Q)

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E0120	Remove Sign Bridge	1	Each
110E0130	Remove Traffic Sign	33	Each
110E5040	Salvage Road Closure Gate	1	Each
250E0010	Incidental Work	Lump Sum	LS
632E0010	1.25' Diameter Breakaway Support Concrete Footing	12.0	Ft
632E0014	1.75' Diameter Breakaway Support Concrete Footing	106.0	Ft
632E1230	W6x15 Steel Post	71.8	Ft
632E1240	W8x18 Steel Post	40.1	Ft
632E1255	W8x28 Steel Post	169.4	Ft
632E1410	3" Diameter Steel Post, .216" Shell	13.3	Ft
632E1415	4" Diameter Steel Post, .237" Shell	26.0	Ft
632E2020	4"x4" White Delineator with 1.12 Lb/Ft Post	25	Each
632E2220	Guardrail Delineator	10	Each
632E2520	Type 2 Object Marker	1	Each
632E3105	Extruded Aluminum Sign, Removable Copy Super/Very High Intensity	2,685.0	SqFt
632E3203	Flat Aluminum Sign, Nonremovable Copy High Intensity	53.5	SqFt
632E3205	Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity	20.0	SqFt
632E5010	Double Beam Sign Bridge	4	Each
635E4010	1 Section Vehicle Signal Head	6	Each
635E5025	2.5' Diameter Footing	8.0	Ft
635E5302	Type 2 Electrical Junction Box	9	Each
635E5400	Electrical Service Cabinet	1	Each
635E5500	Meter Socket	1	Each
635E8015	1.5" Rigid Galvanized Steel Conduit	85	Ft
635E8120	2" Rigid Conduit, Schedule 40	2,535	Ft
635E8220	2" Rigid Conduit, Schedule 80	140	Ft
635E9016	1/C #6 AWG Copper Wire	2,240	Ft
635E9020	1/C #10 AWG Copper Wire	8,961	Ft
635E9505	5/C #14 AWG Copper Tray Cable, K2	60	Ft
900E0045	Drop Arm Road Closure Gate	1	Each

GENERAL NOTES

Permanent sign locations shall be staked in the field by the Engineer. The Contractor shall give the Engineer a minimum of two weeks advance notice to allow for staking prior to sign installation.

The Contractor shall be responsible for contacting South Dakota One Call to locate the utilities at the staked sign installation locations.

Prior to ordering sign posts, the Contractor shall verify post lengths.

REMOVE TRAFFIC SIGNS

Existing Traffic signs within the project limits are summarized in the following Tables;

Remove Traffic Sign.
Remove Sign For Reset.

Signs designated for removal are summarized in the Remove Traffic Sign table.

Existing traffic signs, posts, and hardware removed and not salvaged for reset shall become the property of the Contractor.

All costs associated with the removal and disposal of existing signs, posts, and hardware shall be incidental to the contract unit price per each for "Remove Traffic Sign".

RESET TRAFFIC SIGNS

Signs designated for reset are summarized in the New and Reset Signs, table.

All costs associated with resetting the traffic signs, posts, anchor posts, stiffeners, hardware, and flashing beacons as designated in the New and Reset Signs table shall be incidental to the contract unit price per each for "Reset Sign".

NEW PERMANENT SIGNING

New signs for installation are summarized in the New and Reset Signs, table.

Special design signs are illustrated on the Special Design Signs sheet.

All costs associated with furnishing and installing the new permanent signs, furnishing and installing stiffeners, hardware and side trim molding shall be incidental to the contract unit price per square foot for "Flat Aluminum Sign, Nonremovable Copy High Intensity" or "Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity" or "Extruded Aluminum Sign, Nonremovable Copy Super/Very High Intensity".

SIGN LEGEND, BORDER AND BACKGROUND

All sign materials shall comply with Section 982 of the Specifications. All flat aluminum signs shall be 0.100" sheet aluminum.

SIGN INSTALLATION

Sign installation shall be as shown in the plans.

The installation height of signs shall not exceed the minimum by more than 1.0 foot. Sign posts shall not extend beyond the top of the sign. The post spacing of 2 post installations shall be 3/5 of the total sign width.

Install signs on posts as per the New and Reset Signs table.