

STATE OF SOUTH DAKOTA
 DEPARTMENT OF TRANSPORTATION
 PLANS FOR PROPOSED

PROJECT IM 0296(33)168
INTERSTATE 29 NBL
HAMLIN COUNTY

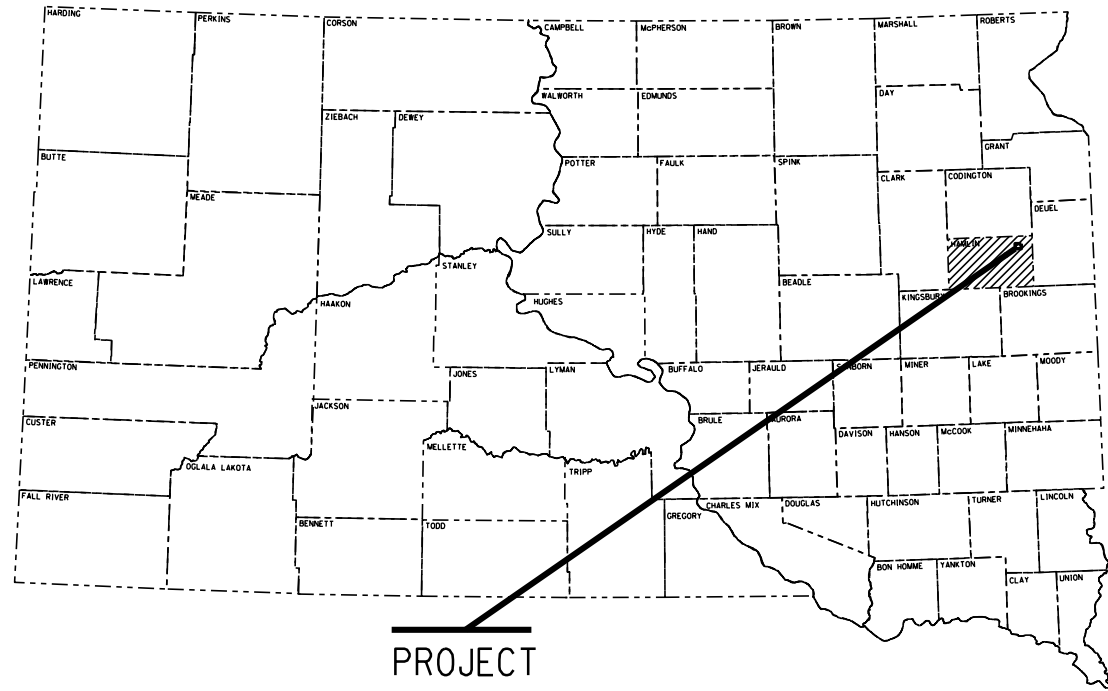
PRESTRESSED GIRDER REPAIR &
 CONCRETE METALIZING
 PCN 07D4

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0296(33)168	1	14
Plotting Date: 02/12/2024			

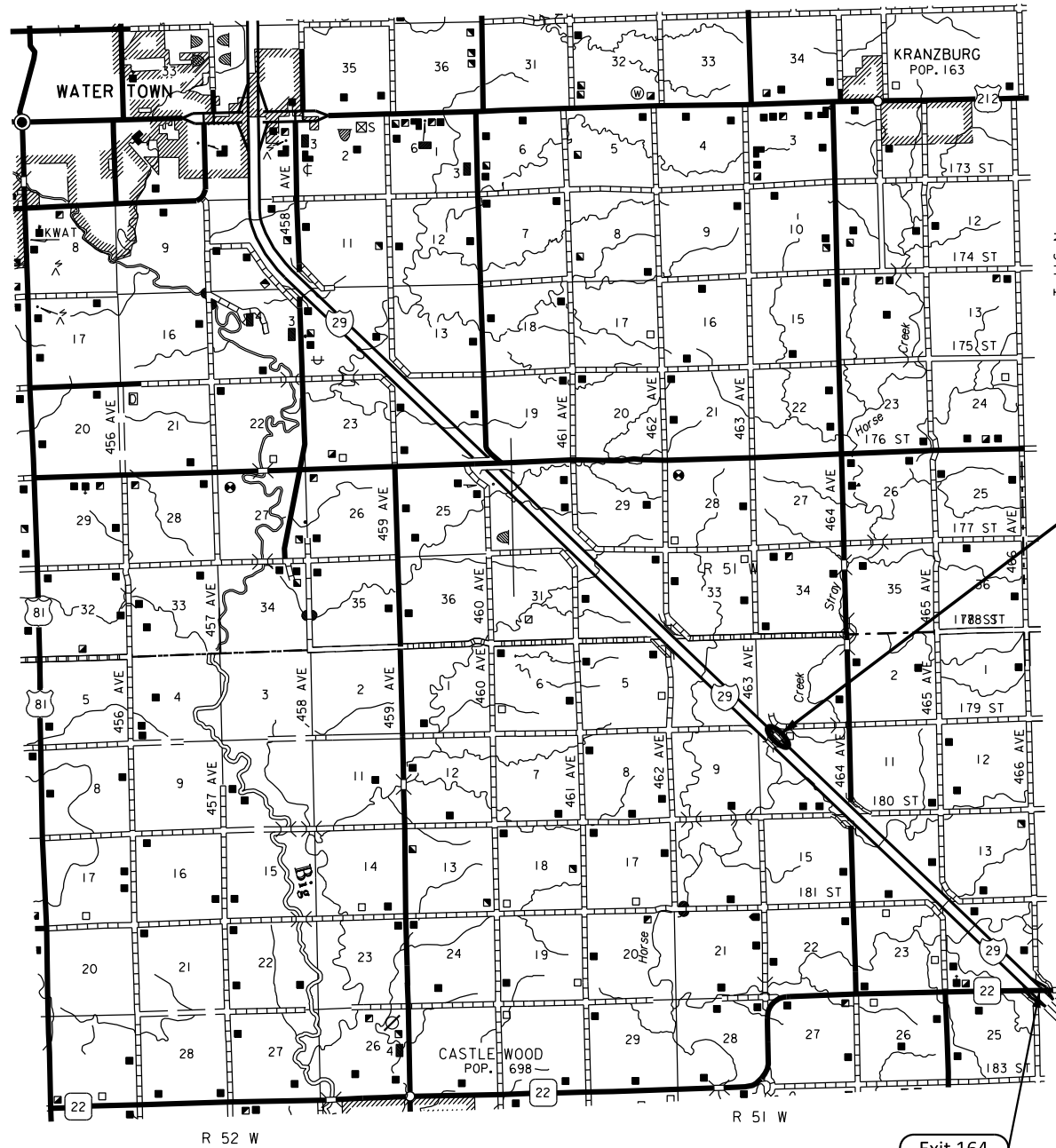
INDEX OF SHEETS

Sheet 1	Title Sheet
Sheet 2-3	Estimate of Quantities & Environmental Commitments
Sheet 4-6	Traffic Control
Sheet 7-14	Structure 29-272-012 Plans

PLOT SCALE - 1" = 10000'



PROJECT



Project Location
 Str. No. 29-272-012
 I-29 NBL
 MRM 168.59

DESIGN DESIGNATION

AADT (2021)	3975
AADT (2041)	5970
DHV	747
D	50%
DHV T%	8.2%
AADT T%	18.0%
V	80 M.P.H.

STORM WATER PERMIT
 NONE REQUIRED

1

May 1, 2024

PLOTTED FROM - TRAB17882

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ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0296(33)168	2	14

GENERAL QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
634E0010	Flagging	10.0	Hour
634E0110	Traffic Control Signs	338.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0275	Type 3 Barricade	4	Each
634E0420	Type C Advance Warning Arrow Board	1	Each
634E0560	Remove Pavement Marking, 4" or Equivalent	240	Ft
634E0600	4" Temporary Pavement Marking Tape Type I	1,920	Ft

STRUCTURE NUMBER 29-272-012

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
460E0174	Concrete Patching Material, Miscellaneous	3.5	CuFt
460E0300	Breakout Structural Concrete	0.2	CuYd
900E7080	Concrete Metalizing	2,048	SqFt

SPECIFICATIONS

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

ENVIRONMENTAL COMMITMENTS

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

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

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

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

COMMITMENT B: FEDERALLY THREATENED, ENDANGERED, AND PROTECTED SPECIES

COMMITMENT B2: WHOOPING CRANE

The Whooping Crane is a spring and fall migratory bird in South Dakota that is about 5 feet tall and typically stops on wetlands, rivers, and agricultural lands along their migration route. An adult Whooping Crane is white with a red crown and a long, dark, pointed bill. Immature Whooping Cranes are cinnamon brown. While in flight, their long necks are kept straight and their long dark legs trail behind. Adult Whooping Cranes' black wing tips are visible during flight.

Action Taken/Required:

Harassment or other measures to cause the Whooping Crane to leave the site is a violation of the Endangered Species Act. If a Whooping Crane is sighted roosting in the vicinity of the project, borrow pits, or staging areas associated with the project, cease construction activities in the affected area until the Whooping Crane departs and immediately contact the Project Engineer. The Project Engineer will contact the Environmental Office so that the sighting can be reported to USFWS.

COMMITMENT C: WATER SOURCE

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

The Contractor will not withdraw water directly from streams of the James, Big Sioux, and Vermillion watersheds without prior approval from the SDDOT Environmental Office.

Action Taken/Required:

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

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

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

COMMITMENT E: STORM WATER

Construction activities constitute less than 1 acre of disturbance.

Action Taken/Required:

At a minimum and regardless of project size, appropriate erosion and sediment control measures must be installed to control the discharge of pollutants from the construction site.

COMMITMENT H: WASTE DISPOSAL SITE

The Contractor will furnish a site(s) for the disposal of construction and/or demolition debris generated by this project.

Action Taken/Required:

Construction and/or demolition debris may not be disposed of within the Public ROW.

The waste disposal site(s) will be managed and reclaimed in accordance with the following from the General Permit for Construction/Demolition Debris Disposal Under the South Dakota Waste Management Program issued by the Department of Agriculture and Natural Resources.

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

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

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

2. Concrete and asphalt concrete debris may be stockpiled within view of the ROW for a period not to exceed the duration of the project. Prior to project completion, the waste will be removed from view of the ROW or buried, and the waste disposal site reclaimed as noted above.

The above requirements will not apply to waste disposal sites that are covered by an individual solid waste permit as specified in SDCL 34A-6-58, SDCL 34A-6-1.13, and ARSD 74:27:10:06.

Failure to comply with the requirements stated above may result in civil penalties in accordance with South Dakota Solid Waste Law, SDCL 34A-6-1.31.

All costs associated with furnishing waste disposal site(s), disposing of waste, maintaining control of access (fence, gates, and signs), and reclamation of the waste disposal site(s) will be incidental to the various contract items.

COMMITMENT I: HISTORIC PRESERVATION OFFICE CLEARANCES

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

Action Taken/Required:

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

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

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

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

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

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

SEQUENCE OF OPERATIONS

The following Sequence of Operations will be adhered to.

1. Install Traffic Control Signing.
2. Complete Prestressed Girder Repair and Metalizing on Prestressed Girders.
3. Switch traffic and complete Prestressed Girder Repair and Metalizing on Prestressed Girders for phase 2.
4. Cleanup project site and remove Traffic Control Signing.

Contractor requests to deviate from the sequence of operations will be submitted in writing to the Engineer for review. Approval of an alternate sequence of operations will only be allowed when the proposed changes meet with the Department's intent for traffic control and sequencing of the work. An alternate sequence will be submitted for review a minimum of one week prior to potential implementation.

GENERAL TRAFFIC CONTROL

One lane of traffic on I-29 northbound will be always maintained. A 16' minimum lane width will be always maintained.

Road Work Ahead signs will be placed on the private road beneath the bridge during the Metalizing on Prestressed Girders. All signing on the private road beneath the bridge will be kept within the I-29 corridor ROW.

If the Metalizing on Prestressed Girders would decrease the vertical clearance by more than 4 feet above the private road beneath the bridge, Road Closed Ahead signs along with a Road Closed signs mounted to a Type 3 Barricade will be placed on the private road. The private road beneath the bridge will only be closed when work is actively being pursued and will be reopened during non-working hours.

Existing guide, route, informational logo, regulatory, and warning signs will be temporarily reset and maintained during construction. Removing, relocating, covering, salvaging, and resetting of existing traffic control devices, including delineation, will be the responsibility of the Contractor. Cost for this work will be incidental to the contract unit prices for the various items unless otherwise specified in the plans. Any delineators and signs damaged or lost will be replaced by the Contractor at no cost to the State.

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

All temporary speed limit signs will have a minimum mounting height of 5 feet in rural locations, even when mounted on portable supports.

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

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

Unless otherwise stated in these plans, work will not be allowed during hours of darkness.

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

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

Traffic will be maintained on the driving lanes. Use of the shoulder as a driving lane will not be permitted. Any damage to the shoulder due to rerouted traffic or Contractor's equipment will be repaired at no expense to the Department.

A Type 3 Barricade will be installed at the end of a lane closure taper as detailed in these plans. Additional Type 3 Barricades will be installed facing traffic within the closed lane at a spacing of 1/4 mile.

Construction vehicles will exit or enter the construction work zone at locations identified by the Engineer. At no time will construction vehicles utilize the maintenance crossovers or the Interstate median to exit or enter Interstate traffic.

If inappropriate or conflicting pavement markings exist, the markings will be removed and replaced with applicable temporary pavement markings when the work duration is more than 3 days. When the work duration is less than 3 days, the channelizing devices in the area where the pavement markings conflict will be placed at one-half of the normal channelizing device spacing. Pavement marking removals will be incidental to the contract unit price per foot for "Remove Pavement Marking, 4" or equivalent". The additional channelizing devices will be incidental to the contract lump sum price for "Traffic Control, Miscellaneous".

LANE CLOSURES

Interstate lane closures will be removed when work will not be occurring for a period of 3 or more calendar days. Activities that do not involve workers being present, such as curing time for concrete, constitute work. Lane closures will not be set up on a Friday if no work will be occurring on Saturday or Sunday. In these cases, the lane closure will be installed on Monday.

WORK ZONE SPEED REDUCTION

The Department is required to obtain a speed reduction resolution prior to the installation of any SPEED LIMIT (R2-1) signs shown on standard plate 634.63. To provide adequate time for the resolution to be enacted, the Contractor will inform the Engineer a minimum of 3 weeks prior to the scheduled installation of any work zone speed reduction signs on the project. The information provided by the Contractor will include the anticipated date of sign installation, the newly reduced speed limit, the location of the work zone, and the anticipated completion date of work requiring the speed reduction.

TEMPORARY PAVEMENT MARKING TAPE, TYPE I

Temporary Pavement Marking Tape Type I will be required for lane tapers as shown on standard plate 634.63. Temporary raised pavement markers may be used in place of Temporary Pavement Marking Tape Type I.

Temporary tape or pavement markers will be removed upon completion of the project.

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD				EXPRESSWAY / INTERSTATE					
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT		
R2-1	SPEED LIMIT 45		24" x 30"	5.0		2	36" x 48"	12.0	24.0		
R2-1	SPEED LIMIT 65		30" x 36"	7.5		3	36" x 48"	12.0	36.0		
R2-1	SPEED LIMIT 80		36" x 48"	12.0		1	48" x 60"	20.0	20.0		
R2-6aP	FINES DOUBLE (plaque)		24" x 18"	3.0		1	36" x 24"	6.0	6.0		
R11-2	ROAD CLOSED	2	48" x 30"	10.0	20.0		48" x 30"	10.0			
W3-5	SPEED REDUCTION AHEAD (45 MPH)		48" x 48"	16.0		1	48" x 48"	16.0	16.0		
W3-5	SPEED REDUCTION AHEAD (65 MPH)		48" x 48"	16.0		2	48" x 48"	16.0	32.0		
W4-2	LEFT or RIGHT LANE ENDS (symbol)		48" x 48"	16.0		2	48" x 48"	16.0	32.0		
W20-1	ROAD WORK AHEAD	2	48" x 48"	16.0	32.0	2	48" x 48"	16.0	32.0		
W20-3	ROAD CLOSED AHEAD	2	48" x 48"	16.0	32.0		48" x 48"	16.0			
W20-5	LEFT or RIGHT LANE CLOSED AHEAD		48" x 48"	16.0		2	48" x 48"	16.0	32.0		
W20-7	FLAGGER (symbol)		48" x 48"	16.0		1	48" x 48"	16.0	16.0		
G20-2	END ROAD WORK		36" x 18"	4.5		1	48" x 24"	8.0	8.0		
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT				84.0	EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS SQFT				254.0

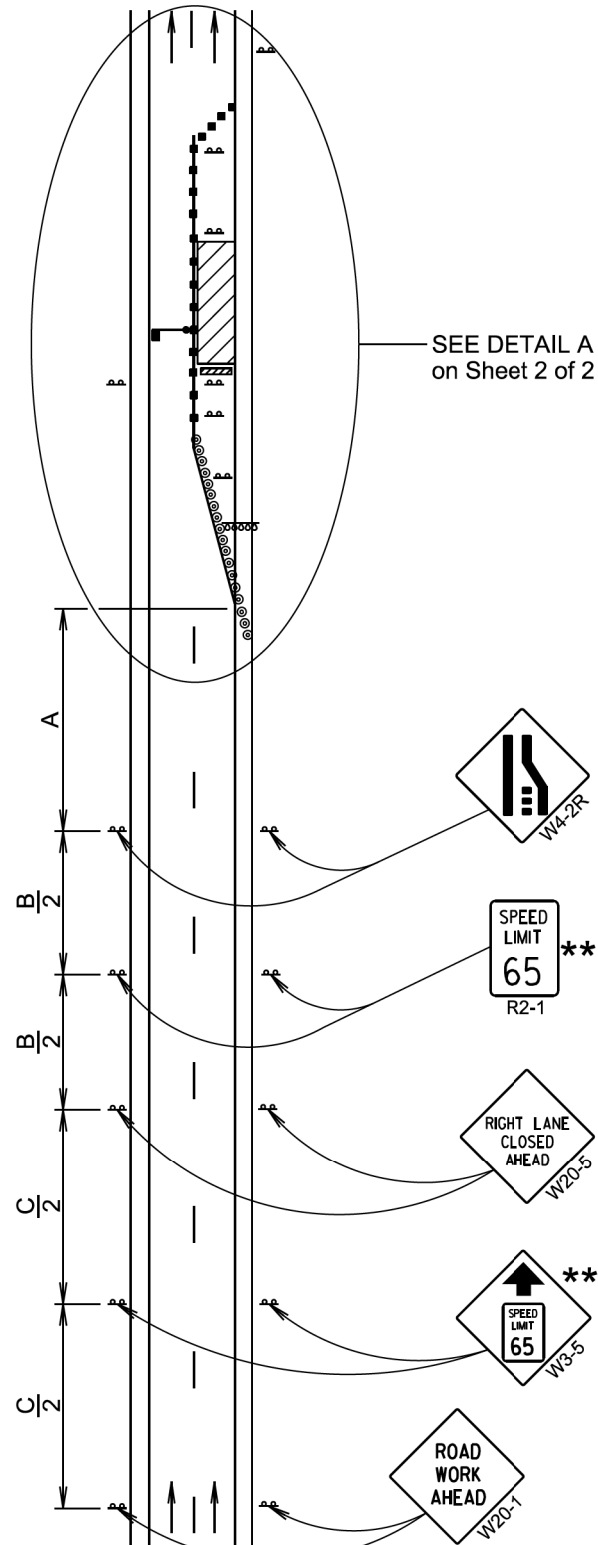
Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet)		
	(A)	(B)	(C)
0 - 30	200		
35 - 40	350		
45 - 50	500		
55	750		
60 - 65	1000		
70 - 80	1000	1500	2640

** Speed appropriate for location.

- ⊙ Reflectorized Drum
- Channelizing Device

ROAD WORK AHEAD sign is only required in advance of the first lane closure.

High speed is defined as having a posted speed limit greater than 45 mph.



SEE DETAIL A on Sheet 2 of 2

September 22, 2021

S D D O T	WORK ZONE SPEED REDUCTION FOR INTERSTATE AND HIGH SPEED MULTI-LANE HIGHWAYS	PLATE NUMBER 634.63
	Published Date: 2024	Sheet 1 of 2

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet) (G)	Taper Length (Feet) (L)
0 - 30	25	180
35 - 40	25	320
45	25	600
50	50 *	600
55	50 *	660
60 - 65	50 *	780
70 - 80	50 *	960

* Spacing is 40' for 42" cones.

** Speed appropriate for location.

*** Use speed limit designated for the condition when workers are present in the work space. Signs will be covered or removed when workers are not present.

● Flagger (As Necessary)

⊙ Reflectorized Drum

■ Channelizing Device

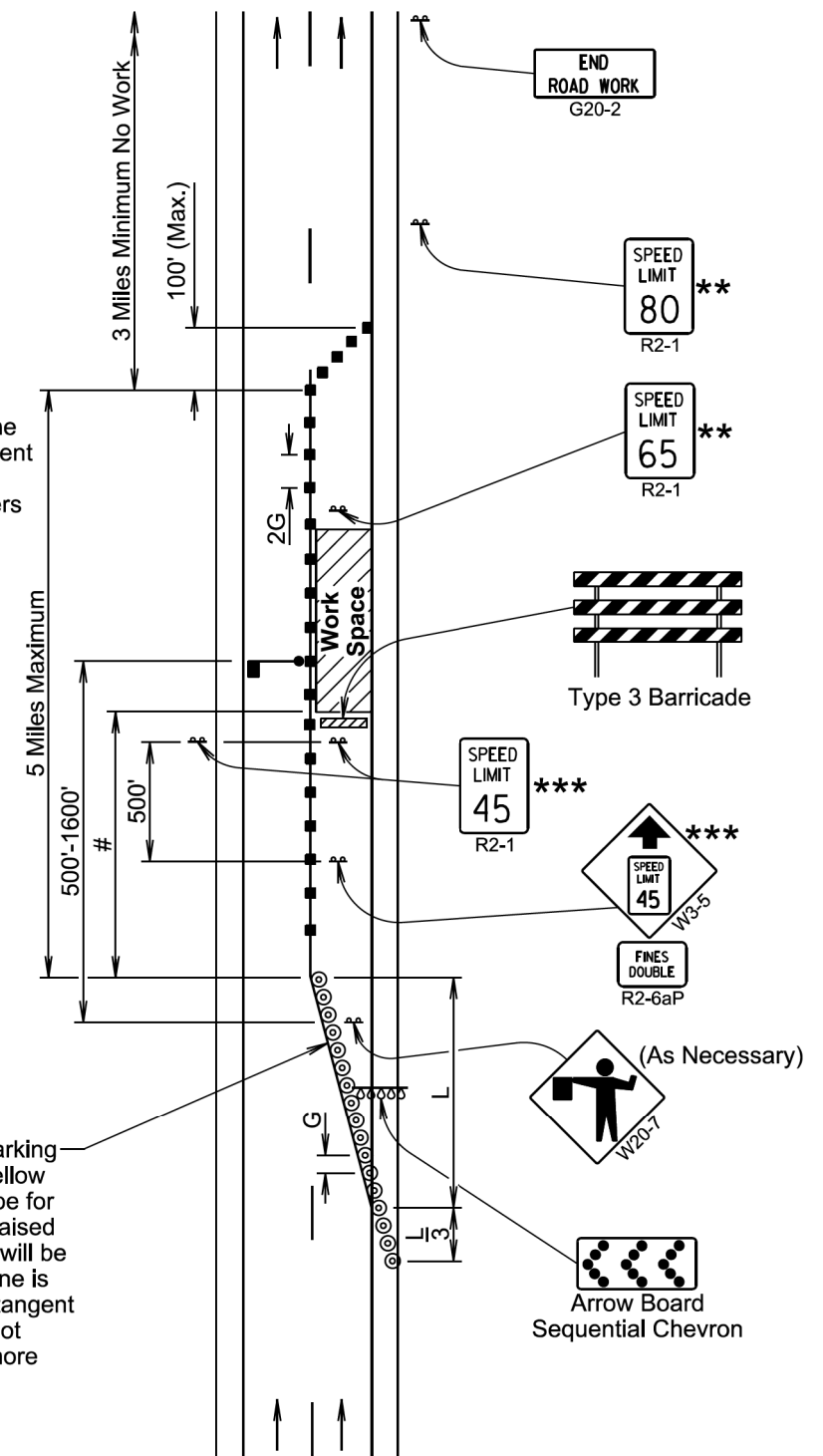
The Work Space will be a minimum of 500' from the end of the taper.

The FLAGGER sign will be used whenever there is a Flagger present.

The channelizing devices will be 42" cones or drums.

42" cones may be used in place of the drums shown in the taper if setup will not be used during night time hours.

4" white temporary pavement marking tape for right lane closures, 4" yellow temporary pavement marking tape for left lane closures, or temporary raised pavement markers at 5' spacing will be installed in the taper when the lane is closed overnight, and along the tangent section where the skip lines do not exist and the lane is closed for more than 3 days.



DETAIL A

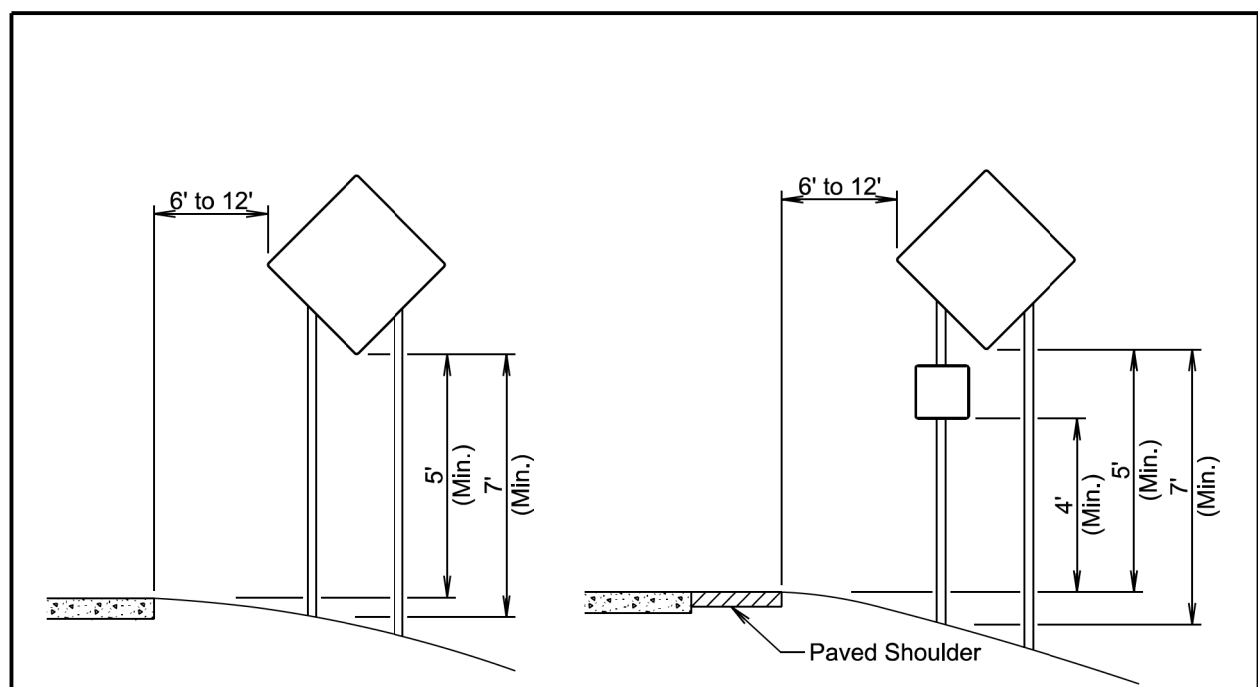
September 22, 2021

S D D O T	WORK ZONE SPEED REDUCTION FOR INTERSTATE AND HIGH SPEED MULTI-LANE HIGHWAYS	PLATE NUMBER 634.63
	Published Date: 2024	Sheet 2 of 2

PLOT SCALE - 1:200

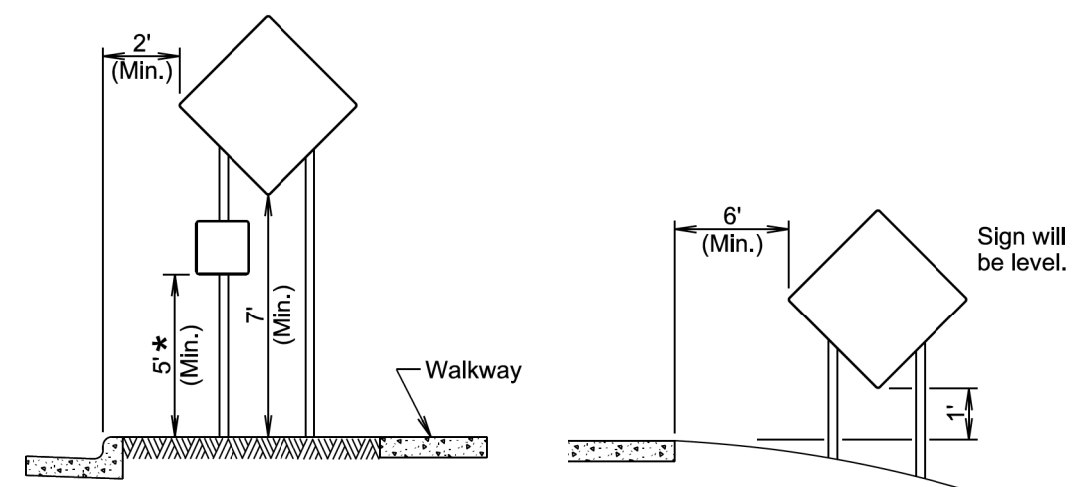
PLOT NAME - 3

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RURAL DISTRICT

RURAL DISTRICT WITH SUPPLEMENTAL PLATE



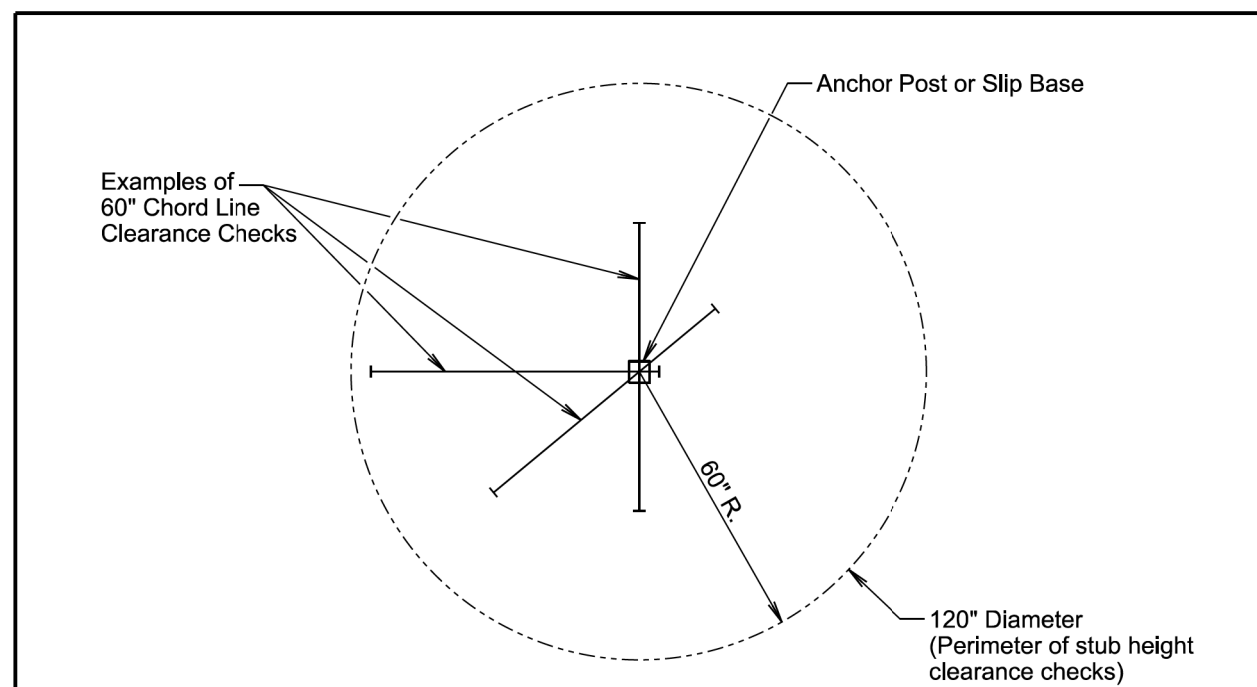
URBAN DISTRICT

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

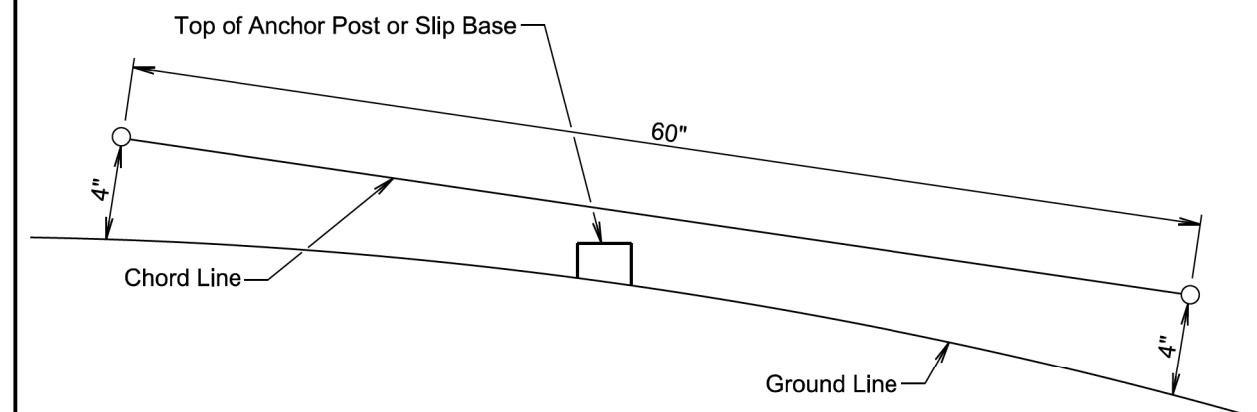
* If the bottom of supplemental plate is mounted lower than 7 feet above a pedestrian walkway, the supplemental plate should not project more than 4" into the pedestrian facility.

January 22, 2021

Published Date: 2024	S D D O T	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85
			Sheet 1 of 1



PLAN VIEW
(Examples of stub height clearance checks)



ELEVATION VIEW

GENERAL NOTES:

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

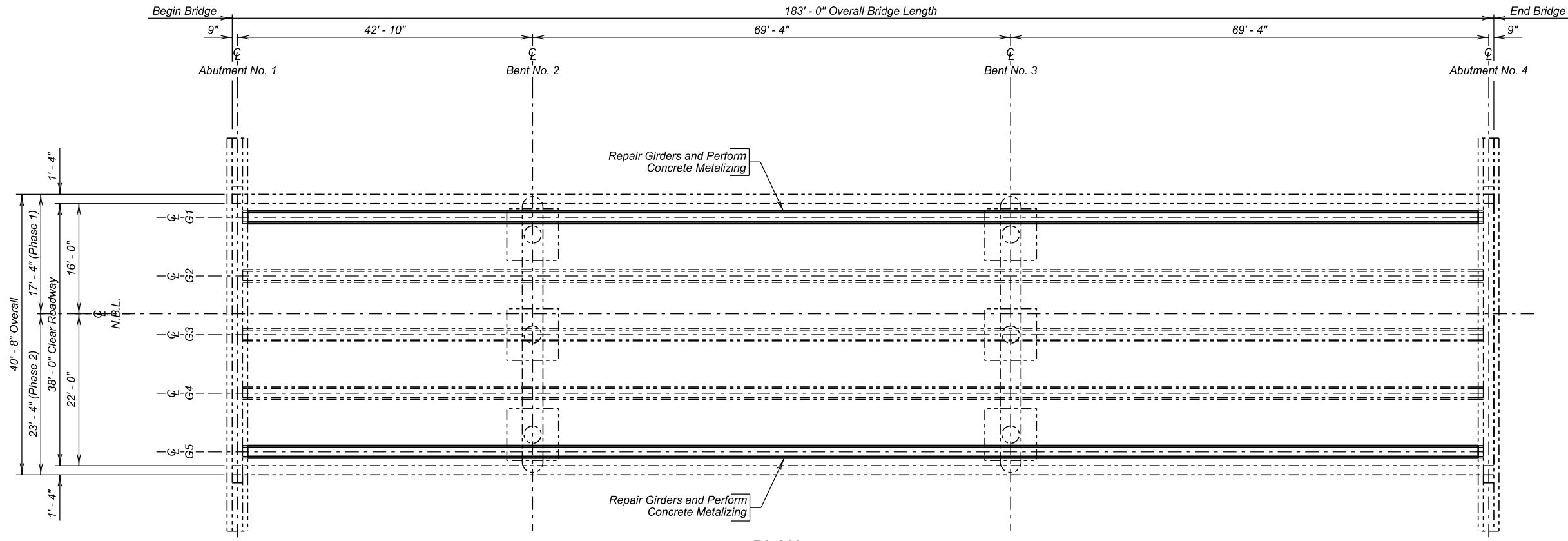
At locations where there is curb and gutter adjacent to the breakaway sign support, the stub height will be a maximum of 4" above the ground line at the localized area adjacent to the breakaway support stub.

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

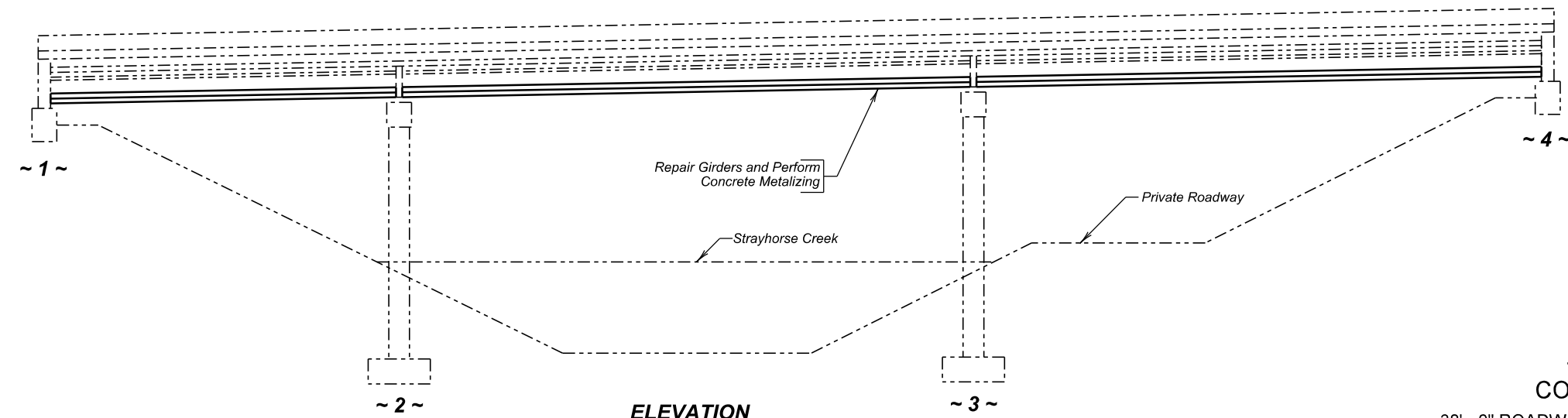
January 22, 2021

Published Date: 2024	S D D O T	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
			Sheet 1 of 1

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0296(33)168	7	14



PLAN



ELEVATION

(NORTHBOUND LANES)
LAYOUT FOR UPGRADE
FOR
183' - 0" PRESTRESSED
CONCRETE GIRDER BRIDGE

38' - 0" ROADWAY
OVER STRAYHORSE CREEK
STR. NO. 29-272-012
PCN 07D4

0° SKEW.
SEC. 10-T115N-R51W
IM 0296(33)168

HAMLIN COUNTY
S. D. DEPT. OF TRANSPORTATION

MARCH 2024 1 OF 8

DESIGNED BY JH HAML07D4	CK. DES. BY TJM 07D4RA01	DRAFTED BY KR	<i>Steve A. Johnson</i> BRIDGE ENGINEER
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PLANS BY:
OFFICE OF BRIDGE DESIGN, SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION

- X481 -
INDEX OF BRIDGE SHEETS -
Sheet No. 1 - Layout for Upgrade
Sheet No. 2 - Estimate of Structure Quantities and Notes
Sheet No. 3 - Girder Repair and Metalizing Details
Sheet Nos. 4 thru 8 - Original Construction Plans

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0296(33)168	8	14

ESTIMATE OF STRUCTURE QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
460E0174	Concrete Patching Material, Miscellaneous	3.5	CuFt
460E0300	Breakout Structural Concrete	0.2	CuYd
900E7080	Concrete Metalizing	2048	SqFt

SPECIFICATIONS

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.

DETAILS AND DIMENSIONS OF EXISTING BRIDGE

- All details and dimensions of the existing bridge, contained in these plans, are based on the original construction plans. It is the Contractor's responsibility to inspect and verify the actual field conditions and any necessary as-built dimensions affecting the satisfactory completion of the work required for this project.
- The stationing shown in the original construction plans is reversed from the current project. As such, labels for the begin and end of bridge as well as the substructure units are reversed.

SCOPE OF BRIDGE WORK & SEQUENCE OF OPERATIONS

All work on this structure will be accomplished with the traffic control shown elsewhere in the plans. Alternate sequence of operations may be submitted by the Contractor for approval by the Engineer a minimum of two weeks prior to the preconstruction meeting.

- Breakout and repair concrete on prestressed girders at designated locations for first phase of construction.
- Perform concrete metalizing on prestressed girders for first phase of construction.
- Switch traffic and repeat steps 1 and 2 for the second phase of construction.

CONCRETE BREAKOUT

- Deteriorated areas on the prestressed girders will be broken out and repaired according to the plans. Breakout limits will remove delaminated concrete and expose at least a half the diameter of the reinforcing steel. The removal area will have vertical edges where practical, feathered edges will not be allowed. The removal limits will be as approved by the Engineer.

- Use chipping hammers not heavier than 15-pound class for concrete removal around rebar. Care will be taken not to damage the reinforcing steel and prestressing strands in the prestressed girders during concrete breakout. Any reinforcing steel or prestressing strands that are damaged during concrete breakout will be replaced or repaired (as approved by the Engineer) by the Contractor at no cost to the Department. All broken out concrete will be disposed of in accordance with the Environmental Commitments.
- The deteriorated areas shown in the plans are an approximation and are based on a delamination survey obtained in April 2022. The actual repair areas will be determined in the field and as approved by the Engineer.
- After removing all loose concrete to the defined limits, the areas will be sandblasted and blown clean with clean, dry, oil-free compressed air at 90 psi. Remove rust on exposed reinforcing steel by scraping, wire brushing, or sand blasting as approved by the Engineer.
- All broken out concrete and discarded reinforcing steel will become the property of the Contractor and will be disposed of at a site obtained by the Contractor and approved by the Engineer. An appropriate site will be as described in the Environmental Commitments.
- During concrete removal operations, no concrete will be allowed to fall into Strayhorse Creek.
- The contract unit price per cubic yard for Breakout Structural Concrete will include breaking out concrete, cleaning, straightening reinforcing steel, and disposal of all broken out material.

VERTICAL SPALL REPAIR

- Concrete used in vertical patching applications on the prestressed girders where forms are not practical will consist of one of the following products, or equal as approved by the Office of Bridge Design.
 - Recrete 20 Min
Dayton Superior
1125 Byers Road
Miamisburg, OH 45342
Phone: (800) 745-3700
Web site: www.daytonsuperior.com
 - Sika Repair 223
Stan Houston Equipment Company, Inc
Sioux Falls, SD 57104
Phone: (605) 336-3727
Web site: www.stanhouston.com
 - Meadow Crete GPS
W.R. Meadows, Inc
P.O. Box 338
Hampshire, IL 60140-2100
Phone: (800) 342-5976
Web site: www.wrmeadows.com

- The concrete patch material will be applied and cured as recommended by the manufacturer and as approved by the Engineer.
- The cost of furnishing and placing vertical patching material including all labor, equipment, tools, and any incidentals necessary to complete the work will be paid for at the contract unit price per cubic foot for Concrete Patching Material, Miscellaneous.

CONCRETE METALIZING

The Concrete Metalizing will be installed in accordance with the Special Provision for Concrete Metalizing.

(NORTHBOUND LANES)
ESTIMATE OF STRUCTURE QUANTITIES AND NOTES

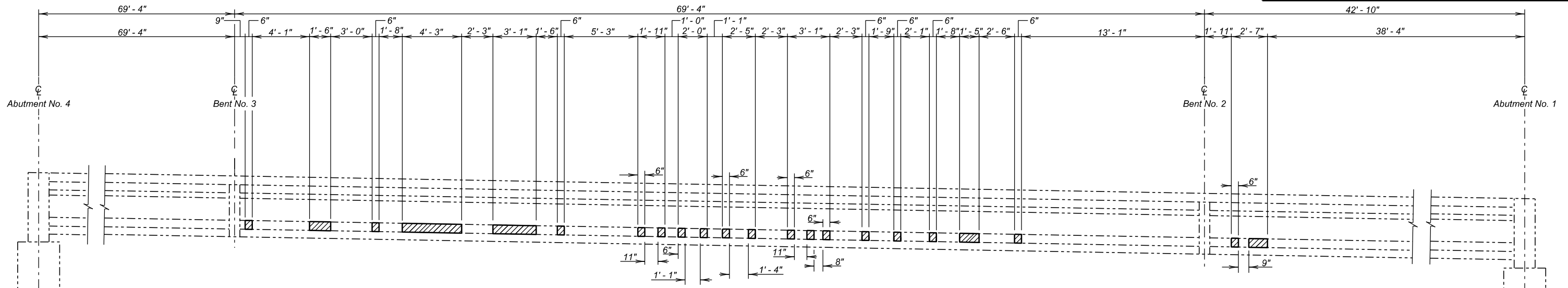
FOR
183' - 0" PRESTRESSED
CONCRETE GIRDER BRIDGE

STR. NO. 29-272-012

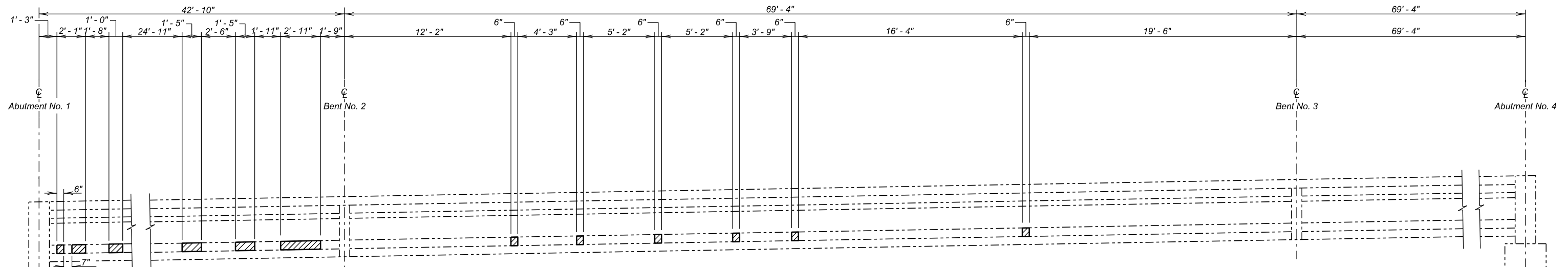
MARCH 2024

2 OF 8

DESIGNED BY JH HAML07D4	CK. DES. BY TJM 07D4RA02	DRAFTED BY KR 	BRIDGE ENGINEER
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ELEVATION
(Girder No. 1, West Face)

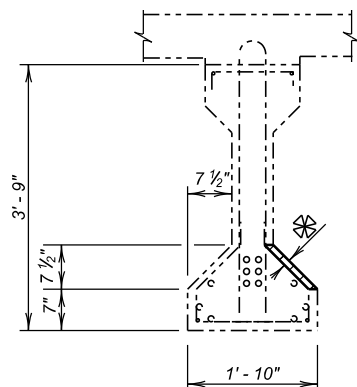


ELEVATION
(Girder No. 5, East Face)

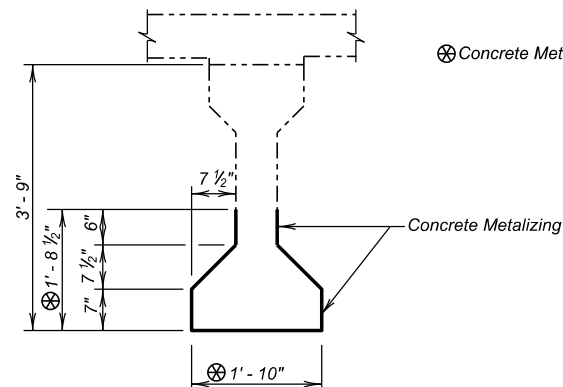
Object lines for metalizing not shown in elevation view for clarity of concrete removal and patching. See TYPICAL METALIZING SECTION for limits of concrete metalizing.

Note:
Concrete Metalizing will be performed on Girder Nos. 1 and 5 along the full length beginning/ending at faces of the diaphragms and abutments.

The depth of clear cover varies at repair locations. Remove delaminated concrete exposing half the depth of exterior reinforcing steel for concrete patching. Quantity based on 1 1/2" removal depth and dimensions shown, actual quantity may vary.



TYPICAL REPAIR SECTION



TYPICAL METALIZING SECTION

Concrete Metalizing Limits

Shaded areas indicate limits of Concrete Removal and Concrete Patching Material.

ESTIMATED QUANTITIES			
ITEM	UNIT	QUANTITY	
		Phase 1	Phase 2
Concrete Patching Material, Miscellaneous	CuFt	2.2	1.3
Breakout Structural Concrete	CuYd	0.1	0.1
Concrete Metalizing	SqFt	1024	1024

* Quantity is based on approximate dimensions shown in these plans. Actual quantity will vary depending on field conditions.

(NORTHBOUND LANES)
GIRDER REPAIR AND METALIZING DETAILS
FOR
**183' - 0" PRESTRESSED
CONCRETE GIRDER BRIDGE**

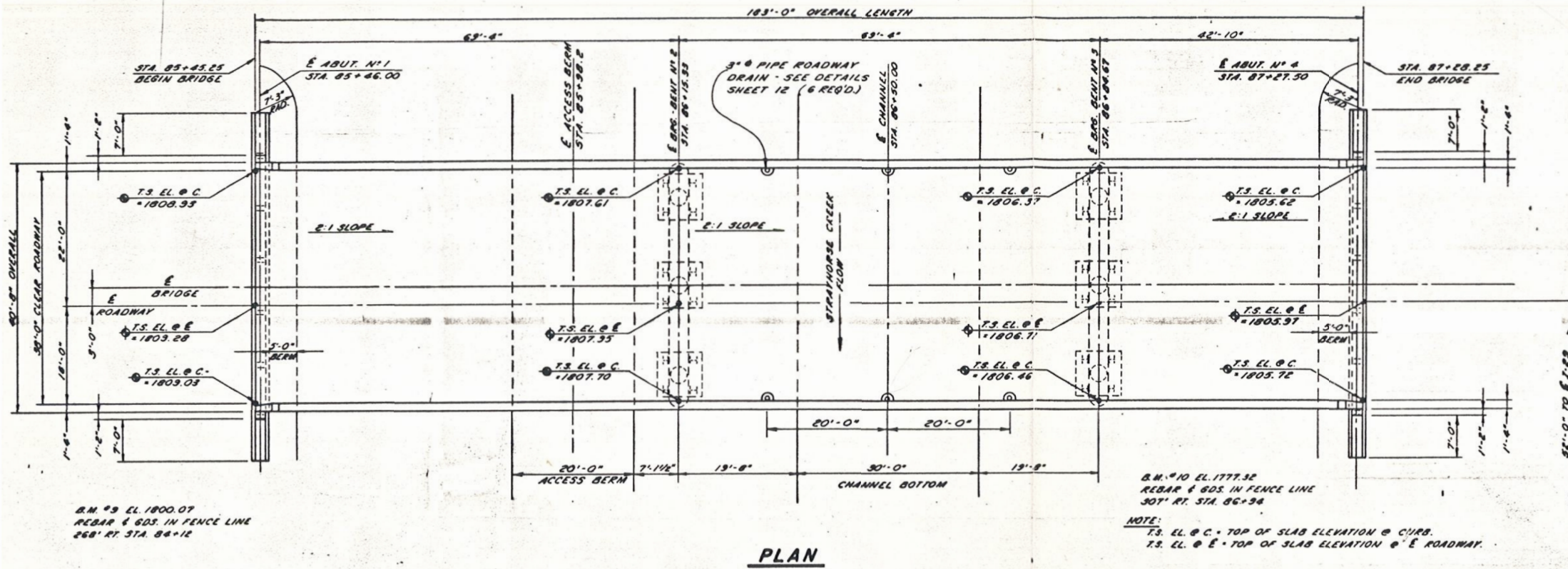
38' - 0" ROADWAY
OVER STRAYHORSE CREEK
STR. NO. 29-272-012

0° SKEW.
SEC. 10-T115N-R51W
IM 0296(33)168

HAMLIN COUNTY
S. D. DEPT. OF TRANSPORTATION

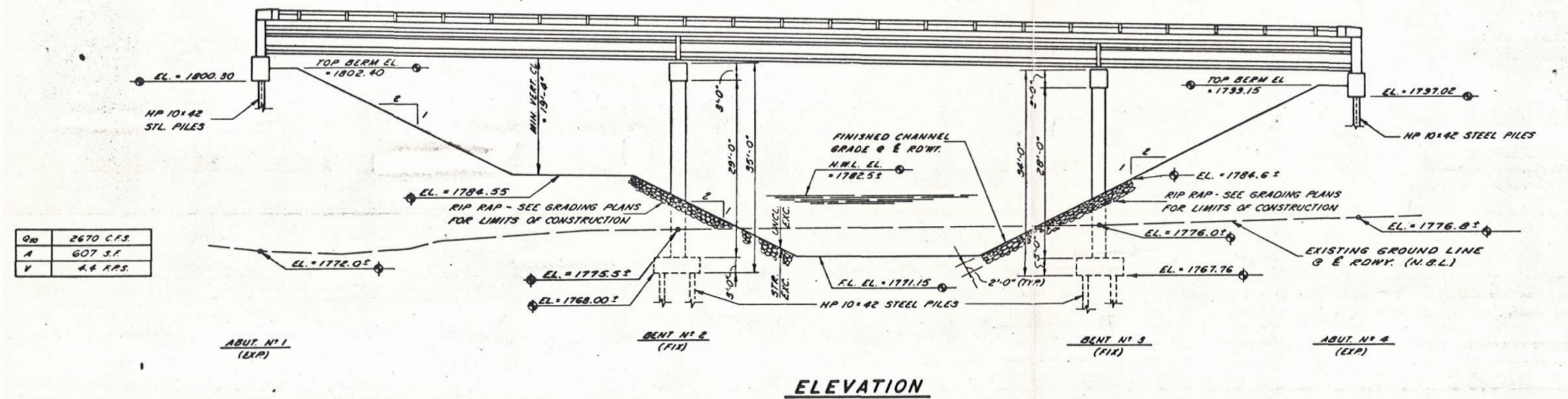
MARCH 2024

3 OF 8



- GENERAL PILE NOTES:**
1. PREBORE PILING THROUGH THE FILL EMBANKMENT TO THE NATURAL GROUND LINE. MINIMUM DIAMETER = 15". (ABUTMENTS NO. 1 AND NO. 4).
 2. PILING SHALL DEVELOP A MINIMUM BEARING VALUE OF 55 TONS PER PILE.
 3. PREBORED HOLES FOR PILES SHALL BE BACKFILLED WITH SAND OR GRANULAR MATERIAL ACCEPTABLE TO THE ENGINEER, AND COMPACTED AS SPECIFIED BY THE ENGINEER. THE COST OF GRANULAR MATERIAL IN PLACE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PREBORING PILING.

- RIP RAP NOTE:**
1. FOR RIP RAP NOTES, SEE ESTIMATE OF STRUCTURE QUANTITIES SHEET.



ORIGINAL CONSTRUCTION PLANS

(NORTH BOUND LANES)
**GENERAL DRAWING & QUANTITIES
 FOR
 183'-0" PRESTRESSED CONCRETE
 GIRDER VIADUCT**

CREEK CROSSING OVER STRAYHORSE CREEK I.S. 29 STA. 85+45.25 TO 87+28.25
 SEC. 10-T 115N - R51W 0° SKEW I-29-6 (6) 158

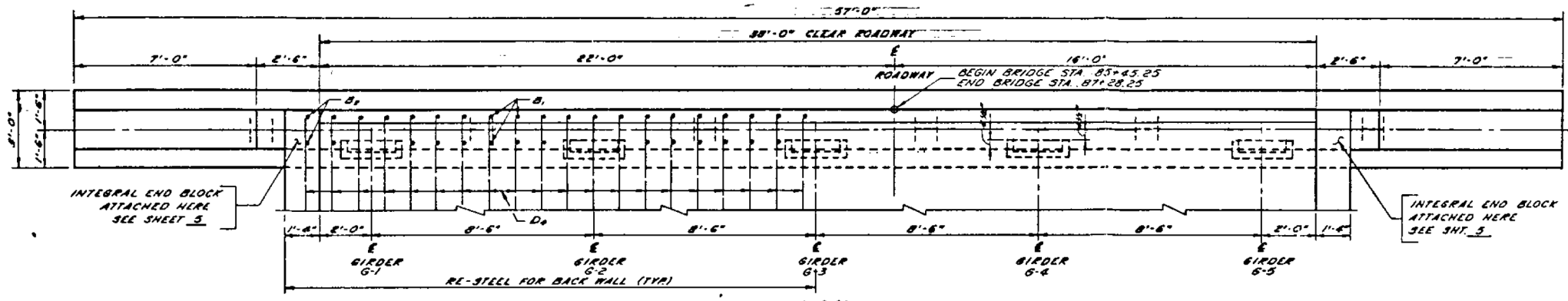
STR. NO. 29-272-012 **HAMLIN COUNTY SOUTH DAKOTA**

PREPARED BY:
J.T. BANNER & ASSOCIATES, INC.
 CONSULTING ENGINEERS
 BROOKINGS, SOUTH DAKOTA
 OCT. 1969

HS 20-44 & ALTERNATE

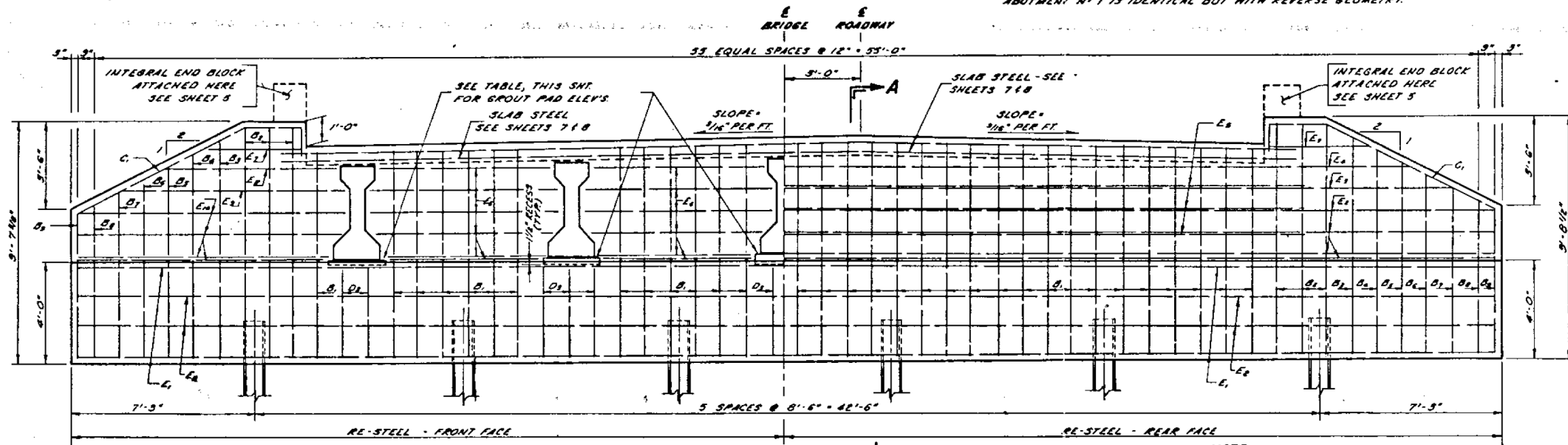
	TOTAL ESTIMATED QUANTITIES											TOTAL	TOTAL	TOTAL	
	CONCRETE CLASS 3*	STEEL STRUCT	PRESTRESSED CONCRETE BEAMS TYPE III	TYPE III-28 STEEL RAILING	STEEL PILES HP 10 X 42	PREBORING PILING	STRUCTURAL EXCAVATION (GRAD 3%)	MUNCLAS EXCAVATION	GRADGO ROAD BACKFILL	RIP RAP CLASS 3					
	CU YDS	LBS	LBS	60' 3" / 42' 1"	LN FT	LBS	LN FT	CU YDS	CU YDS	LUMP SUM	TONS				
SUPERSTRUCTURE	1152	52,640	45	10	3227										
ABUTMENT N° 1	40.0	4,950	68			663542*	6226190	38							
BENT N° 2	48.8	5,210				128,671.82*		190			3900				
BENT N° 3	47.5	5,065				125,714.4*		160							
ABUTMENT N° 4	40.0	4,950	68			663542*	6226190	38							
TOTAL	1390.1	100,815	145	10	3227	1317,168*	12,454,370	380	380		3900				

* ONE STEEL BEARING TEST PILE SHALL BE DRIVEN AT ABUTMENTS N° 1 AND N° 4 AND AT BENTS N° 2 & N° 3 BEFORE REMAINING PILES ARE DRIVEN.
 * FOR INFORMATION ONLY, THE APPROXIMATE VOLUME GRANULAR BACKFILL WILL BE 230 CU YDS. IN PLACE, AND THE LENGTH OF THE 6" PERFORATED METAL PIPE WILL BE 168 LIN. FT. COMPLETE FOR TWO ABUTMENTS.
 * TO BE DONE BY OTHERS * INCLUDES THAT QUANTITY OF RIP RAP FROM CHANNEL CHANGE STA. 1+00 TO STA. 4+00 ONLY.

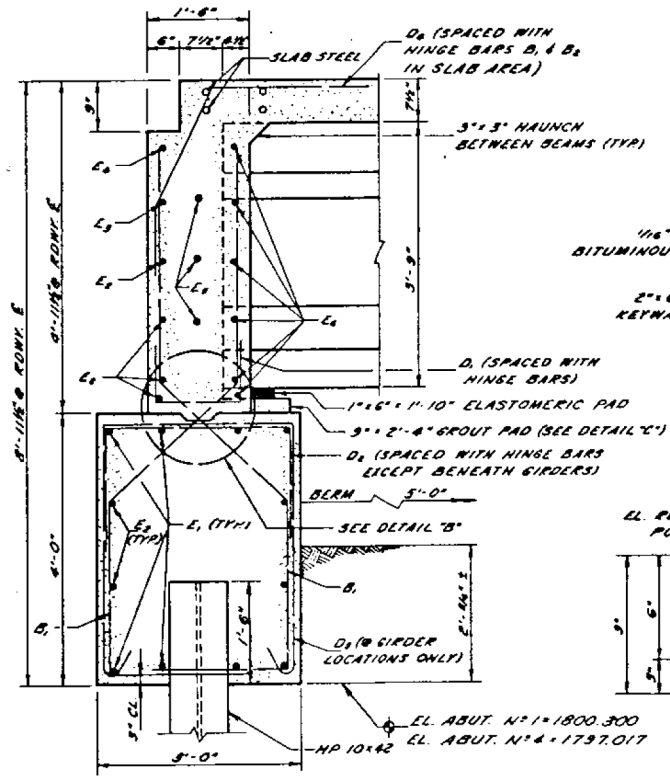


PLAN

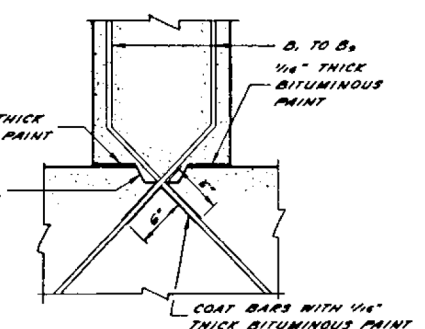
NOTE:
PLAN & ELEVATION VIEWS SHOWN ARE FOR ABUTMENT NO. 4
ABUTMENT NO. 1 IS IDENTICAL BUT WITH REVERSE GEOMETRY.



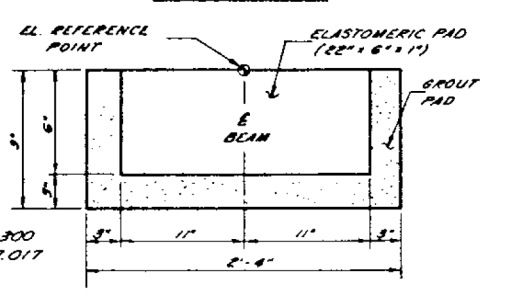
ELEVATION



SECTION A-A



DETAIL "B"



DETAIL "C"

LOCATION	ABUT. NO. 1	ABUT. NO. 4
GIRDER G-1	1804.391	1801.108
GIRDER G-2	1804.523	1801.240
GIRDER G-3	1804.656	1801.373
GIRDER G-4	1804.617	1801.334
GIRDER G-5	1804.484	1801.201

ITEM	UNIT	QUANTITY
CLASS "A" CONCRETE	CU YDS	1438.4
REINFORCING STEEL	TONS	237.0
STRUCT. EXCAVATION	CU YDS	30
ENCLOSING PALMS	LN/FT	2
INCLUDES 1/2" CU YDS FOR GROUT PADS		
SEE GENERAL DRAWING & QUANTITIES SHEET 2		
SEE NOTE #11 ON THIS SHEET		

GENERAL ABUTMENT NOTES:

- DESIGN SPECIFICATIONS: AASHTO SPECIFICATIONS FOR HIGHWAY BRIDGES 1969, WITH INTERIM SPECIFICATIONS FOR 1970.
- DESIGN LOADING: HS 20-44 AASHTO AND ALTERNATE LOADING AS DESIGNATED IN PPM 20-4, SEC. 4C.
UNIT STRESSES RE-STEEL $f_s = 20,000$ PSI
CONCRETE $f_c = 4,000$ PSI
 $f_c = 1,600$ PSI
- ALL REINFORCING STEEL BARS SHALL CONFORM TO ASTM SPECIFICATIONS A615, GRADE 40.
- USE 2" CLEAR COVER ON ALL REINFORCING STEEL EXCEPT AS SHOWN.
- ALL EXPOSED EDGES SHALL BE CHAMFERED 1" EXCEPT AS SHOWN.
- THE QUANTITY OF GROUT IS INCLUDED IN AND SHALL BE PAID FOR AS CLASS "A" CONCRETE.
- PILING SHALL DEVELOP A MINIMUM BEARING VALUE OF 55 TONS PER PILE.
- SEE GENERAL DRAWING, SHEET 2, FOR LENGTH OF PILES.
- CHAMFER GROUT PADS 3/4".
- REQUESTS FOR CONSTRUCTION JOINTS OR RE-STEEL SPLICES AT POINTS OTHER THAN SHOWN MUST BE SUBMITTED TO THE BRIDGE SECTION FOR APPROVAL. IF ADDITIONAL SPLICES ARE APPROVED, NO PAYMENT WILL BE ALLOWED FOR ADDED QUANTITY OF RE-STEEL.
- THE ESTIMATED QUANTITIES SHOWN ON THIS SHEET DO NOT INCLUDE THE QUANTITIES FOR END BLOCKS SHOWN ON SHEET 5, BUT DO INCLUDE THE SLAB & CURBS DIRECTLY OVER THE ABUTMENT BACKWALL.

REINFORCING SCHEDULE
(ONE ABUTMENT)

MK.	NO.	SIZE	LENGTH	TYPE
B1	64	6	9'-9"	41
B2	12	6	11'-6"	
B3	4	6	11'-0"	
B4	4	6	10'-6"	
B5	4	6	10'-0"	
B6	4	6	9'-6"	
B7	4	6	9'-0"	
B8	4	6	8'-6"	
B9	4	6	8'-3"	9A
C1	4	5	11'-6"	13A
D1	58	4	3'-0"	510
D2	48	4	6'-6"	510
D3	12	6	10'-6"	53
D4	40	5	6'-3"	14A
E1	16	8	29'-6"	STR
E2	16	5	29'-6"	STR
E3	2	5	27'-6"	
E4	2	5	25'-6"	
E5	6	5	21'-6"	
E6	24	4	6'-6"	
E7	4	4	4'-0"	
E8	2	4	6'-3"	
E9	2	4	9'-0"	
E10	8	4	10'-0"	STR

BENDING DETAILS

* BEND OR CUT IN THE FIELD AS NECESSARY.
NOTE: ALL DIMENSIONS ARE OUT-TO-OUT OF BARS.

ORIGINAL CONSTRUCTION PLANS

(NORTH BOUND LANES)
ABUTMENT DETAILS
FOR
183'-0" PRESTRESSED CONCRETE GIRDER VIADUCT

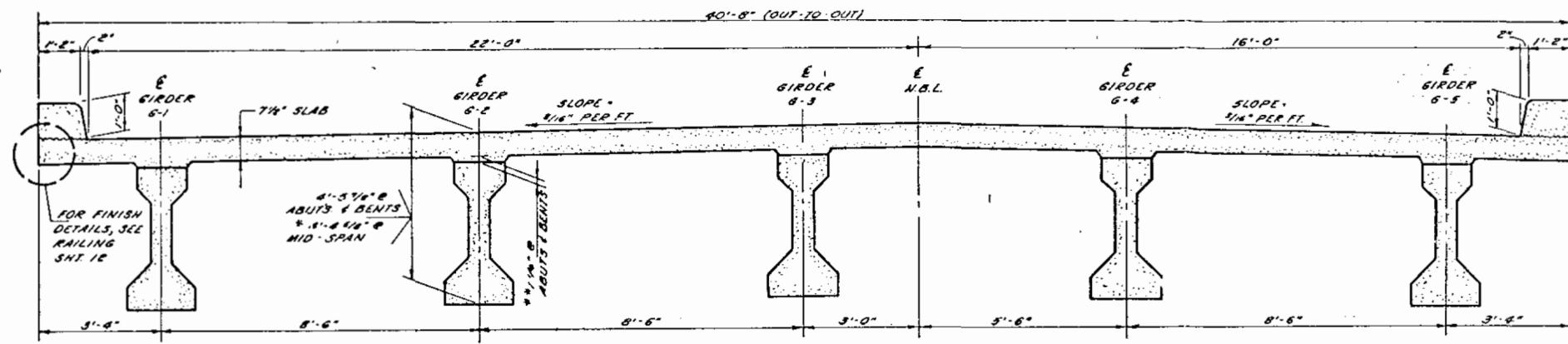
CREEK CROSSING
38'-0" ROADWAY
OVER STRAYHORSE CREEK
I.S. 29 STA. 85+45.25 TO 87+28.25
STR. NO. 29-272-012
HAMLIN COUNTY
SOUTH DAKOTA

SEC. 10-T 115N-R 51W
0° SKEW
1-29-6(6)158

PREPARED BY:
J.T. BANNER & ASSOCIATES, INC.
CONSULTING ENGINEERS
BROOKINGS, SOUTH DAKOTA
OCT. 1969

HS 20-44
& ALTERNATE

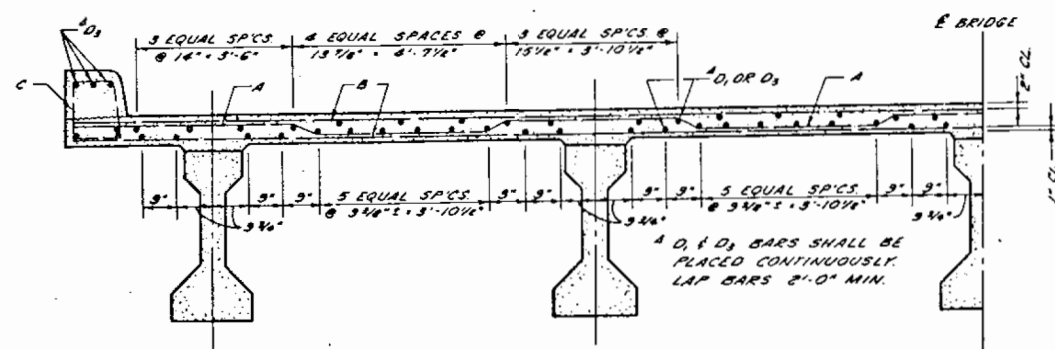
5 OF 8



FULL SLAB SECTION

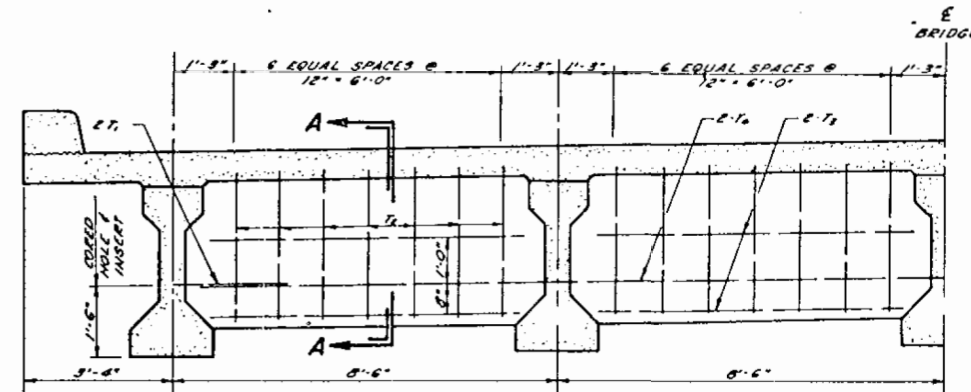
(SHOWING DIMENSIONS)

* VARIES WITH FINAL GIRDER CAMBER
** DECREASES TOWARD E SPAN



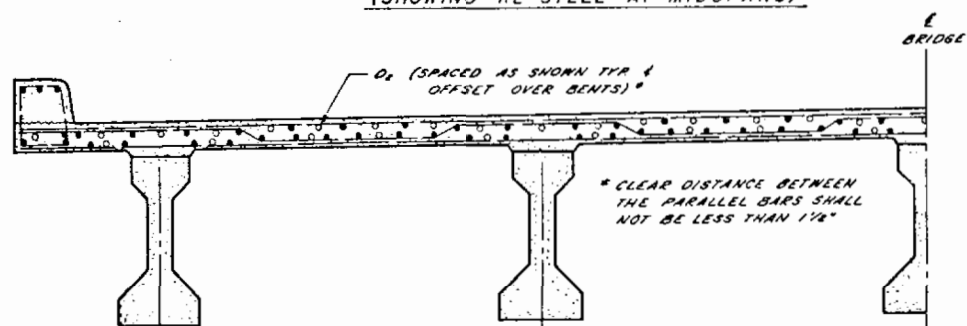
HALF SLAB SECTION

(SHOWING RE-STEEL AT MIDSPANS)



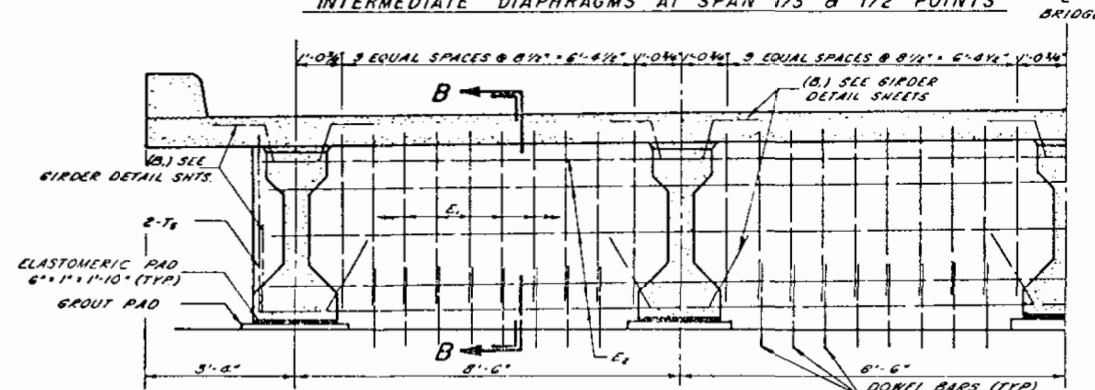
HALF ELEVATION

INTERMEDIATE DIAPHRAGMS AT SPAN 1/3 & 1/2 POINTS



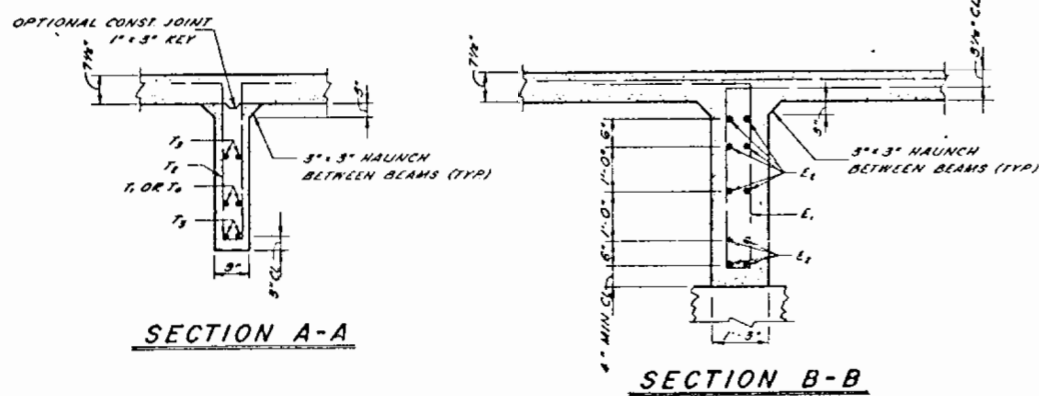
HALF SLAB SECTION

(SHOWING RE-STEEL OVER BENTS NO. 2 & NO. 3)



HALF ELEVATION

DIAPHRAGM OVER BENTS NO. 2 AND NO. 3



GENERAL NOTES:

- SEE SHEET NO. 8 FOR "GENERAL DIAPHRAGM NOTES", "GENERAL CONCRETE POURING NOTES", AND "GENERAL SUPERSTRUCTURE NOTES".
- HALF SECTION & HALF ELEVATION VIEWS ARE FOR FORWARD STATIONS. BRIDGE E AND ROADWAY E ARE OFFSET AS SHOWN ON FULL SLAB SECTION VIEW.

REINFORCING SCHEDULE

NO.	SIZE	LENGTH	TYPE	BENDING DETAILS
A	213	5	41'-6"	T5
B	436	5	40'-3"	STR
C	352	4	3'-3"	T1
D	228	5	42'-6"	STR
D ₂	102	5	25'-0"	STR
D ₃	112	5	60'-0"	STR
E	80	4	15'-6"	T5
E ₁	20	5	35'-0"	STR
T	20	8	4'-0"	STR
T ₁	140	4	3'-3"	SB
T ₂	80	4	7'-6"	STR
T ₃	10	7	35'-0"	STR
T ₄	8	4	3'-0"	STR

NOTE: ALL DIMENSIONS ARE OUT-TO-OUT OF BARS.

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY
CLASS III CONCRETE	CU YDS	215 1/2
REINFORCING STEEL	LBS	80,640
PRECAST BEAMS - 48" x 72"	NO	10
PRECAST BEAMS - 42" x 72"	NO	15
RY-BAY STEEL RAILING	LIN FT	352.7
STRUCTURAL STEEL	LBS	45

ORIGINAL CONSTRUCTION PLANS

(NORTH BOUND LANES)
SUPERSTRUCTURE DETAILS

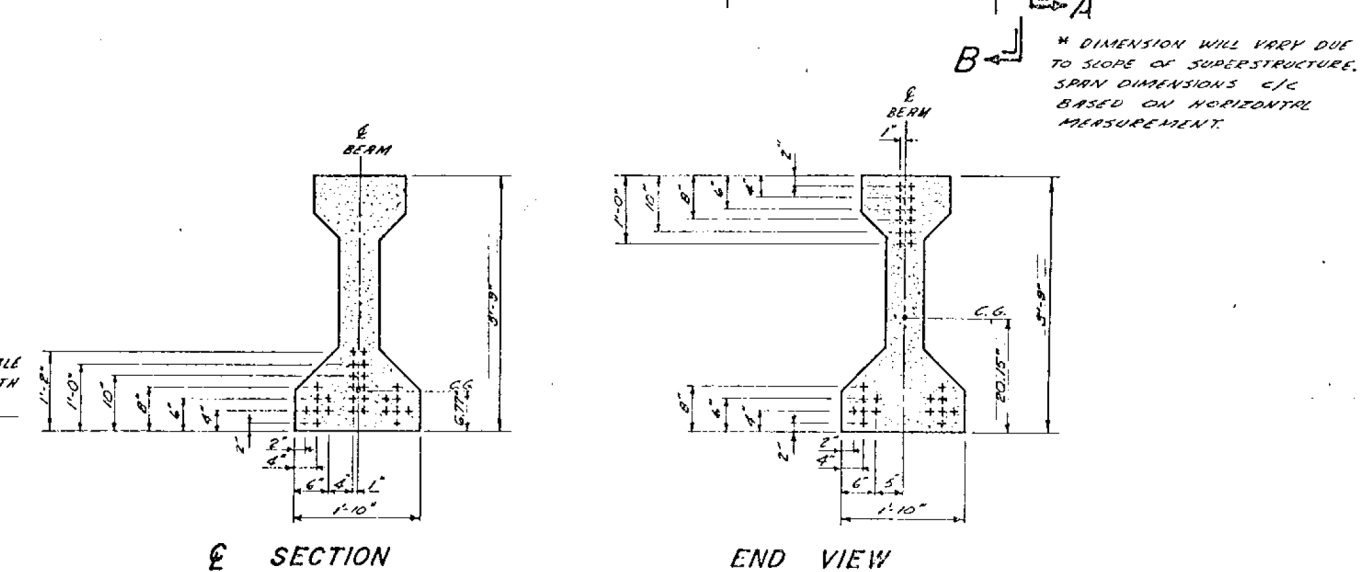
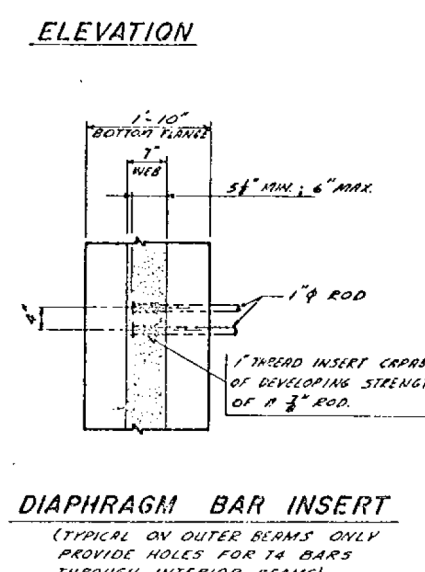
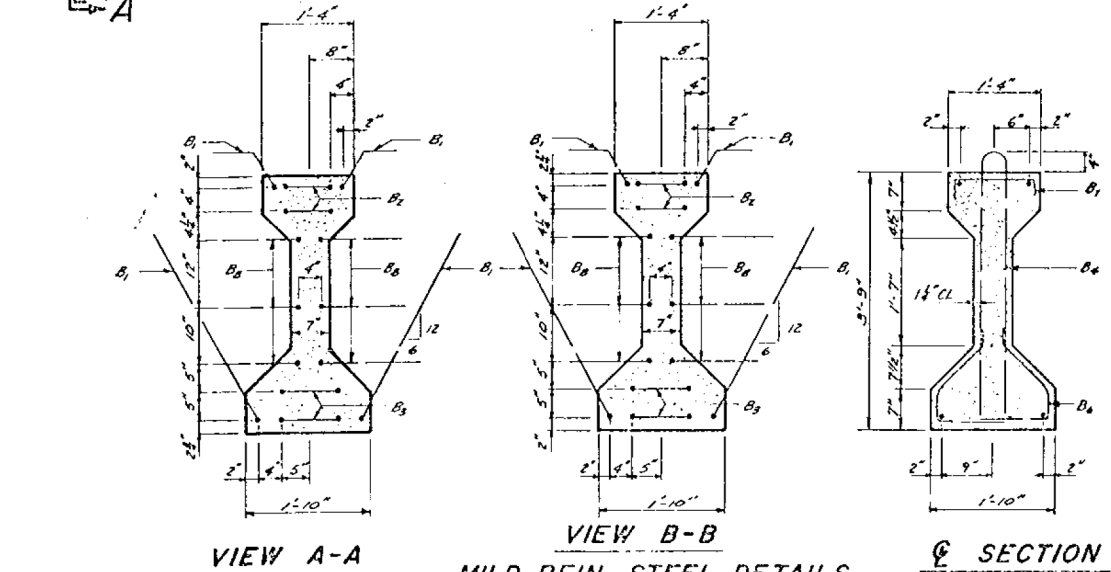
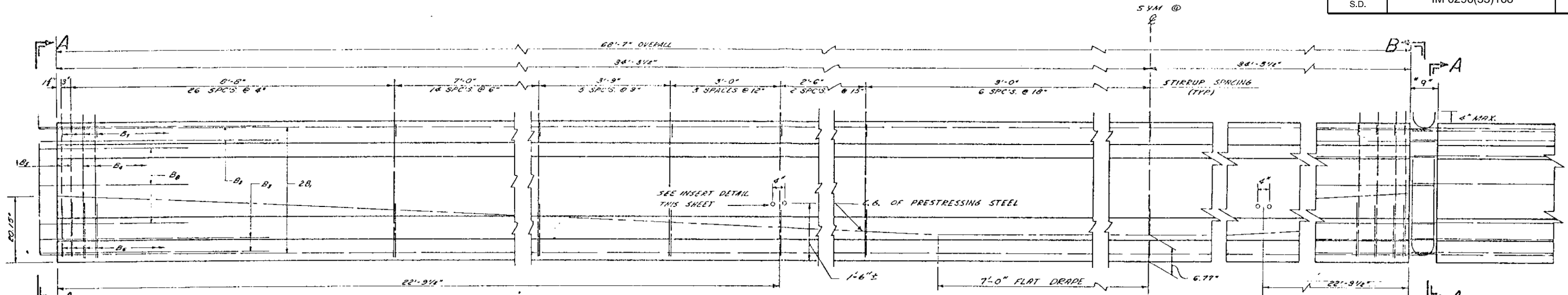
FOR
183'-0" PRESTRESSED CONCRETE
GIRDER VIADUCT

CREEK CROSSING 38'-0" ROADWAY OVER STRAYHORSE CREEK
SEC. 10-T115 N-R51 W 0° SKEW I-29-6 (6) 150
I.S. 29 STA. 85+45.25 TO 87+28.25

STR. NO. 29-272-012 HAMLIN COUNTY SOUTH DAKOTA

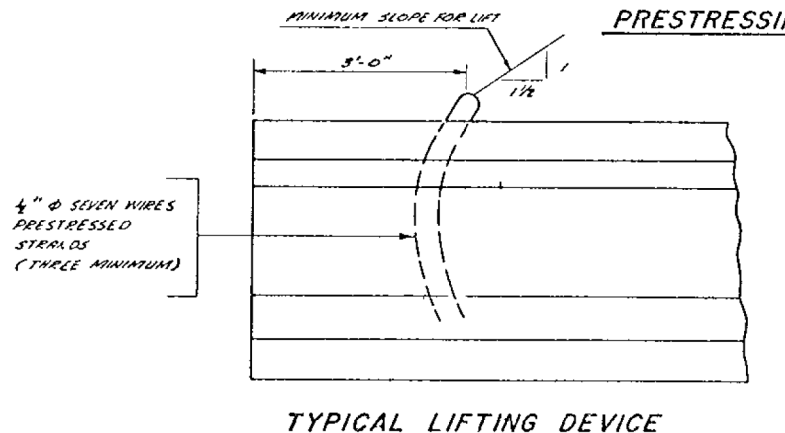
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OCT. 1969

HS 20-44 & ALTERNATE



* DIMENSION WILL VARY DUE TO SLOPE OF SUPERSTRUCTURE. SPAN DIMENSIONS C/C BASED ON HORIZONTAL MEASUREMENT.

REINFORCING SCHEDULE					BENDING DETAILS	
NO.	SIZE	LENGTH	TYPE			
B ₁	8	35'-9"	11A			
B ₂	6	13'-0"	S10			
B ₃	4	13'-0"	S10			
B ₄	111	5	S-11			
B ₅	4	8'-0"	S-11			
B ₆	230	4	S-16			
B ₇	115	4	S-10A			
B ₈	12	4	17-A			



NOTE:
 1. SEE SHEET _____ FOR GENERAL NOTES PERTAINING TO PRESTRESSED CONCRETE.
 2. ONE END OF EACH BEAM SHALL BE CONSTRUCTED ACCORDING TO VIEW A-A AND THE OTHER END ACCORDING TO VIEW B-B.
 3. BEAM CROSS-SECTION DIMENSIONS SHALL CONFORM TO A. A. S. M. C. - R. C. I. TYPE III.

ORIGINAL CONSTRUCTION PLANS

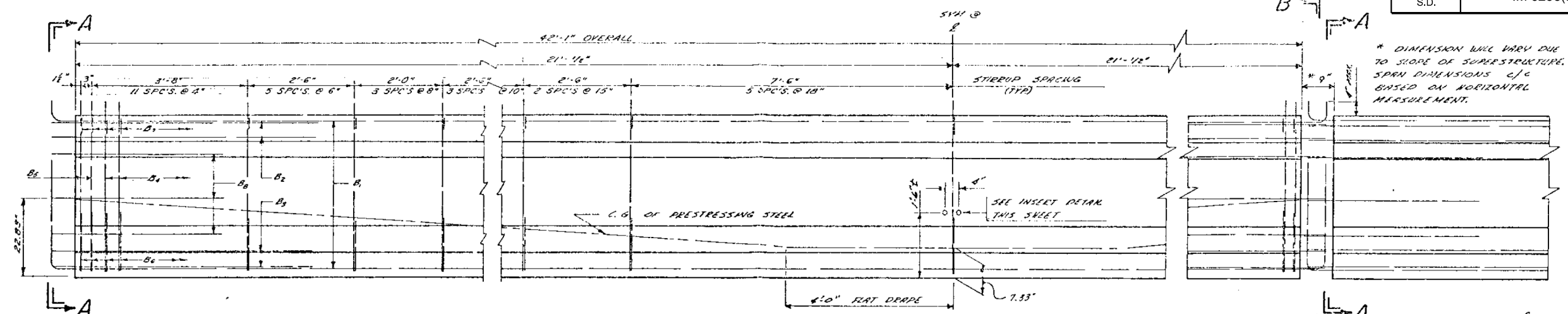
(NORTH BOUND LANES)
 69'-4" SPAN GIRDER DETAILS
 FOR
 183'-0" PRESTRESSED CONCRETE
 GIRDER VIADUCT

CREEK CROSSING SEC. 10-T 115N-R51W
 38'-0" ROADWAY 0° SKEW
 OVER STRAYHORSE CREEK I-29-6 (6) 158
 I.S. 29 STA. 85+45.25 TO 87+28.25

STR. NO. 29-272-012 HAMLIN COUNTY
 SOUTH DAKOTA

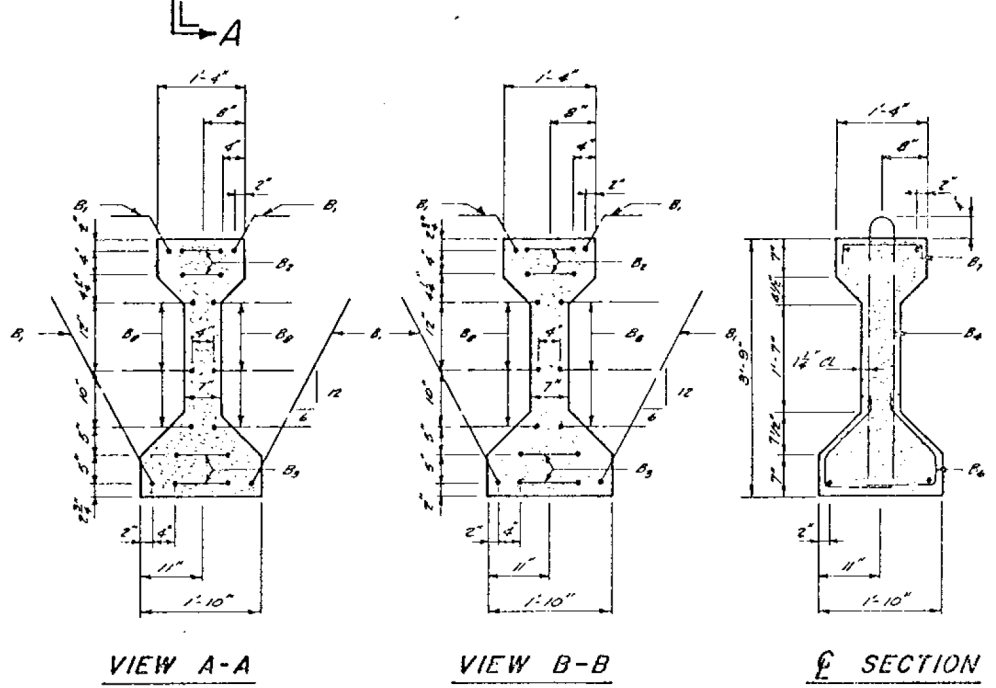
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 OCT. 1969

HS 20-44
 & ALTERNATE
 7 OF 8

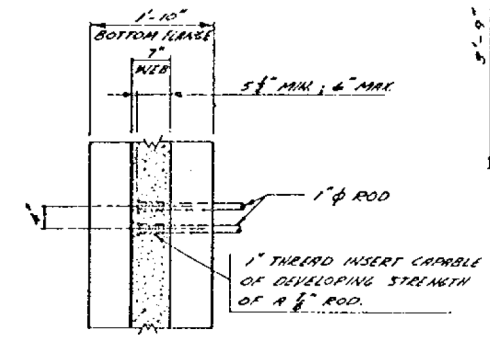


* DIMENSION WILL VARY DUE TO SLOPE OF SUPERSTRUCTURE. SPAN DIMENSIONS C/I BASED ON HORIZONTAL MEASUREMENT.

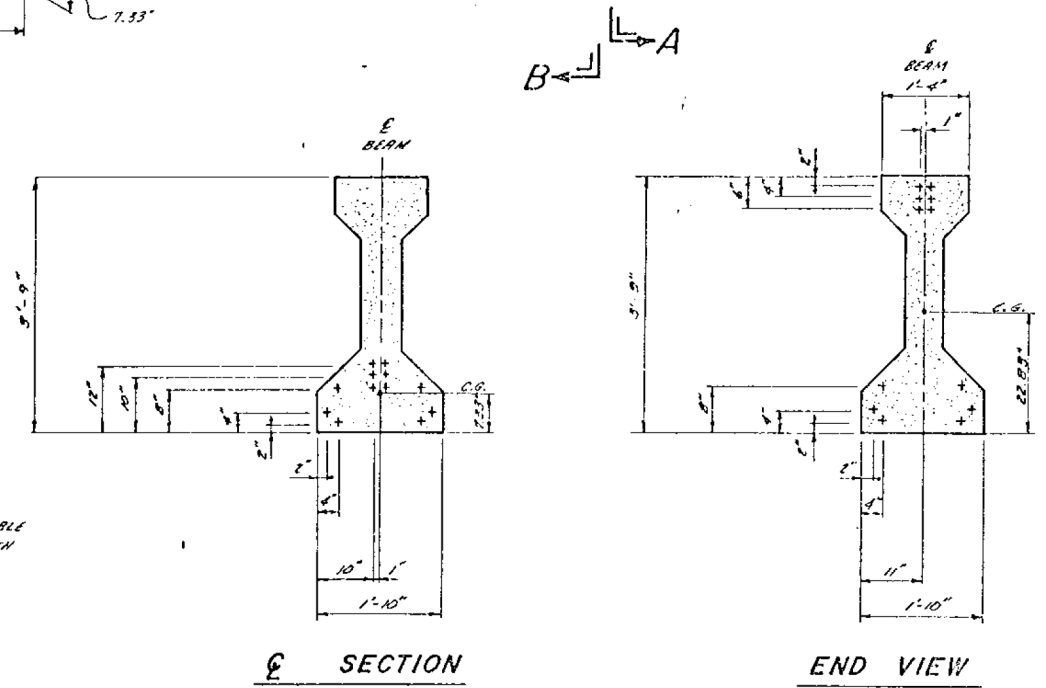
ELEVATION



MILD REIN. STEEL DETAILS



DIAPHRAGM BAR INSERT
(TYPICAL ON OUTER BEAMS ONLY, PROVIDE HOLES FOR TA BARS THROUGH INTERIOR BEAMS)

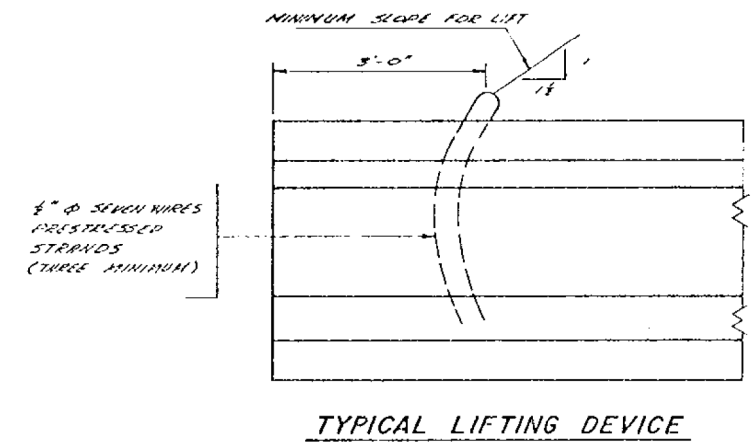


PRESTRESSING STEEL DETAILS

REINFORCING SCHEDULE					BENDING DETAILS	
BAR	NO.	SIZE	LENGTH	TYPE		
B ₁	8	6	25'-6"	11-A		
B ₂	4	6	13'-0"	5-10		
B ₃	4	6	13'-0"	5-10		
B ₄	57	8	8'-0"	5-11		
B ₅	4	6	8'-0"	5-11		
B ₆	122	4	2'-9"	5-16		
B ₇	61	4	1'-9"	5-10A		
B ₈	12	4	5'-6"	17-A		
B ₉						
B ₁₀						

NOTE: BEND BARS B₁ IN FIELD TO CLEAR SURFACE OVER ALL BEAMS AND TO CLEAR ENDS OF DIAPHRAGMS OF BENT. CUT B₂ BARS IN FIELD AT OUTSIDE FACE OF EXTERIOR GIRDER AS NECESSARY.

NOTE: ALL DIMENSIONS ARE OUT TO OUT OF BARS.



NOTE:
 1. SEE SHEET _____ FOR GENERAL NOTES REFERRING TO PRESTRESSED CONCRETE.
 2. ONE END OF EACH BEAM SHALL BE CONSTRUCTED ACCORDING TO VIEW A-A AND THE OTHER END ACCORDING TO VIEW B-B.
 3. BEAM CROSS-SECTION DIMENSIONS SHALL CONFORM TO A.A. S. No. - R.C.I. TYPE III.

ORIGINAL CONSTRUCTION PLANS

(NORTH BOUND LANES)
 42'-10" SPAN GIRDER DETAILS
 FOR
 183'-0" PRESTRESSED CONCRETE
 GIRDER VIADUCT

CREEK CROSSING
 38'-0" ROADWAY
 OVER STRAYHORSE CREEK
 I.S. 29 STA. 85+45.25 TO 87+28.25

SEC. 10-T 115N - R51W
 0° SKEW
 I-29-6 (6) 158

STR. NO. 29-272-012 HAMLIN COUNTY
 SOUTH DAKOTA

PREPARED BY:
 J.T. BANNER & ASSOCIATES, INC.
 CONSULTING ENGINEERS
 BROOKINGS, SOUTH DAKOTA
 OCT. 1959

HS 20-44
 & ALTERNATE