STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	090E-468	1	15

Plotting Date: 04/20/2015

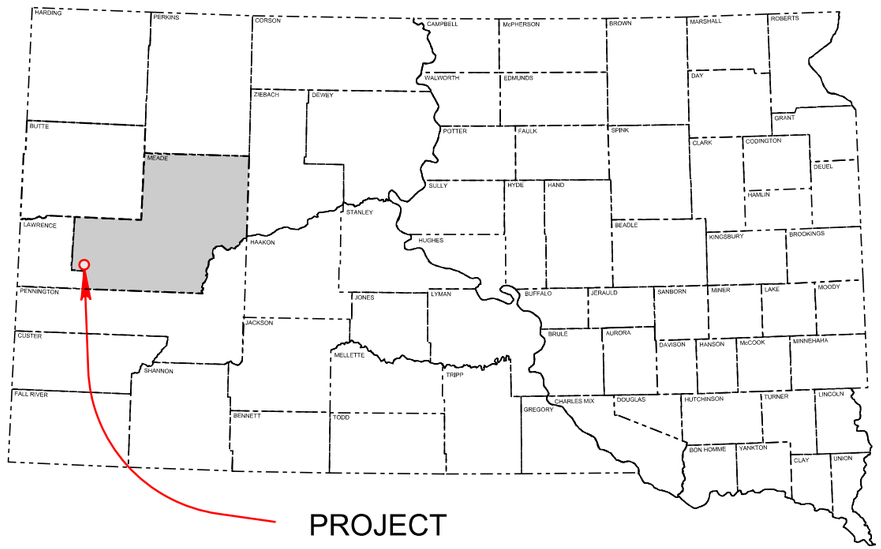
STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION

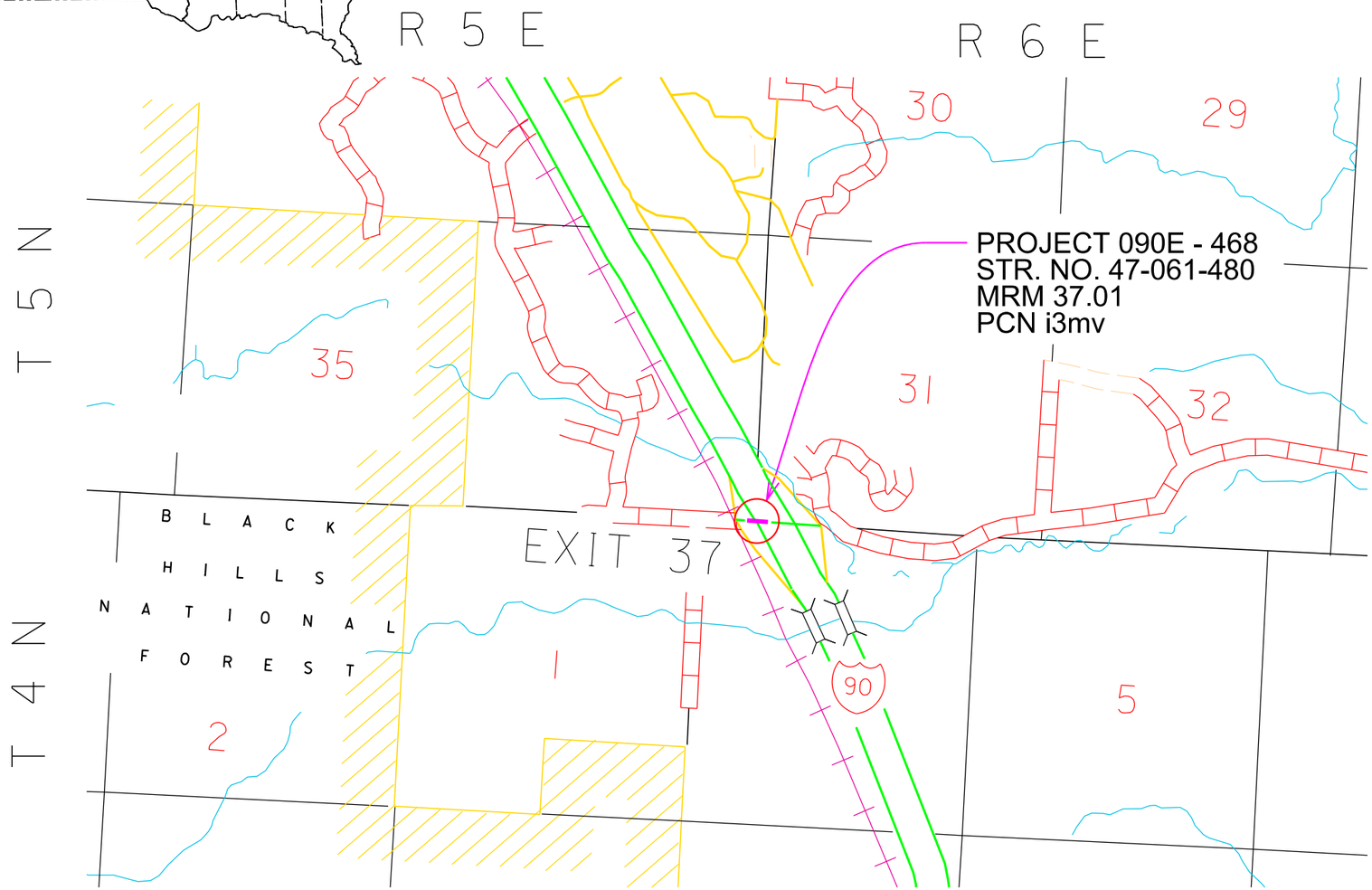
PLANS FOR PROPOSED

PROJECT 090E-468
INTERSTATE 90
MEADE COUNTY

PCN i3mv
Bridge Repair

INDEX OF SHEETS





DESIGN DESIGNATION

ADT (2012)	8511
ADT (2032)	10783
DHV	1337
D	50 %
T DHV	6.5%
T ADT	12.0 %
V	75 MPH

STORM WATER PERMIT

None Required

Estimate of Quantities

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
250E0030	Incidental Work, Structure	Lump Sum	LS
410E0250	Heat Straighten Steel Member(s)	Lump Sum	LS
410E0508	Field Weld	23	In
410E0512	Grind Weld	23	In
410E0515	Drill Hole in Existing Steel	2	Each
410E0520	Surface Grinding of Structural Steel	45	SqIn
410E3010	Magnetic Particle Weld Inspection	924	In
410E3030	Magnetic Particle Weld Inspection, Impact Damage Repair	372	SqIn
412E0100	Bridge Repainting, Class I	Lump Sum	LS
412E0500	Paint Residue Containment	Lump Sum	LS
634E0010	Flagging	100	Hour
634E0100	Traffic Control	585	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0420	Type C Advance Warning Arrow Panel	1	Each

SPECIFICATIONS

Standard Specifications for Roads & Bridges, 2004 Edition and Required Provisions, Supplemental Specifications and/or Special Provisions as included in the Proposal.

ENVIRONMENTAL COMMITMENTS

An Environmental Commitment is a measure that SDDOT commits to implement in order to avoid, minimize, and/or mitigate a real or potential environmental impact. Environmental commitments to various agencies and the public have been made to secure approval of this project. An agency mentioned below with permitting authority can influence a project if perceived 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. These environmental commitments are not subject to change without prior written approval from the SDDOT Environmental Office. The environmental commitments associated with this project are as follows:

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 pit, or staging site associated with the project, cease construction activities in the affected area until the Whooping Crane departs and 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 shall not withdraw water with equipment previously used outside the State of South Dakota without prior approval from the SDDOT Environmental Office. Thoroughly wash all construction equipment before entering South Dakota to reduce the risk of invasive species introduction into the project vicinity.

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 shall 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 State ROW.

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

The waste disposal site(s) shall 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 Project Engineer.

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

1. Construction and/or demolition debris consisting of concrete, asphalt concrete, or other similar materials shall be buried in a trench completely separate from wood debris. The final cover over the construction and/or demolition debris shall consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the State ROW shall be seeded in accordance with Natural Resources Conservation Service recommendations. The seeding recommendations may be obtained through the appropriate County NRCS Office. The Contractor shall control the access to waste disposal sites not within the State ROW through the use of 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 of time not to exceed the duration of the project. Prior to project completion, the waste shall 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) shall be incidental to the various contract items.

COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES

The SDDOT has obtained concurrence with the State Historical Preservation Office (SHPO or THPO) for all work included within the project limits and all designated option borrow sites provided within the plans.

Action Taken/Required:

All earth disturbing activities not designated within the plans require review of cultural resources impacts. This work includes, but is not limited to: staging areas, borrow sites, waste disposal sites, and all material processing sites.

The Contractor shall arrange and pay for a cultural resource survey and/or records search. 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; however, a cultural resources survey may need to be conducted by a qualified archaeologist.

The Contractor shall provide ARC with the following: a topographical map or aerial view on 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 shall submit the records search or cultural resources survey report and if the location of the site is within the current geographical or historic boundaries of any South Dakota reservation to SDDOT Environmental Engineer, 700 East Broadway Avenue, Pierre, SD 57501-2586 (605-773-3180). 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.

If evidence for cultural resources is uncovered during project construction activities, then such activities shall cease and the Project Engineer shall be immediately notified. The Project Engineer will contact the SDDOT Environmental Engineer in order 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 staging areas, borrow sites, waste disposal sites, or material processing sites that affect wetlands, threatened and endangered species, or waterways. The Contractor shall provide the required permits and clearances to the Project Engineer at the preconstruction meeting.

TRAFFIC CONTROL – GENERAL NOTES

1. Requests to deviate from the sequence of operations shall 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 shall be submitted for review a minimum of one week prior to potential implementation.

2. Unless otherwise stated in these plans, no work will be allowed during hours of darkness. Hours of darkness are defined as ½ hour after sunset until ½ hour before sunrise.

3. Storage of vehicles and equipment shall be as near the right-of-way as possible. Contractor's employees should mobilize at a location off the right-of-way and arrive at the work sites in a minimum number of vehicles necessary to perform the work. Indiscriminate driving and parking of vehicles within the right-of-way will not be permitted. Any damage of 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.

4. Existing guide, route, informational logo, regulatory, warning signs and delineation shall be temporarily reset and maintained during construction as directed by the Engineer. Removing, relocating, salvaging and resetting of the above items shall be the responsibility of the Contractor.

5. All non-applicable existing signing and temporary traffic control devices shall be covered or removed during periods of inactivity. Periods of inactivity shall be defined as no work taking place for a period of more than 48 hours. The cost of removing or covering non-applicable signs and temporary traffic control devices shall be incidental to the contract lump sum price for Traffic Control, Miscellaneous.

6. Construction signing mounted on portable supports shall not be used for a duration of more than 3 days, unless approved by the Engineer. Construction signing that remains in the same location for more than 3 days shall be mounted on fixed location, ground mounted, breakaway supports.

7. The quantity of traffic control units paid for will be for the greatest number of installations per sign in place at any one time regardless of the number of set-ups on the project.

8. Any delineators and signs damaged or lost shall be replaced by the Contractor at no cost to the State.

9. All materials and equipment shall be stored a minimum distance of 30' from the traveled way during nonworking hours.

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

11. The Contractor shall be required to have a person available 24 hour/day, 7 days/week to maintain traffic control devices. The name and cellular telephone number of this individual shall be given to the Engineer at the preconstruction meeting.

12. The Contractor or designated traffic control subcontractor shall make night inspections at the initial set up of traffic control and every week thereafter to ensure the adequacy, legibility and reflectivity of each sign and device. A written summary of each inspection shall be given to the Engineer within 24 hours after completion of the inspection. The cost for the nighttime inspection work shall be incidental to the contract lump sum price for Traffic Control, Miscellaneous.

13. Vehicles working in traffic or alongside traffic shall be equipped with a flashing amber light visible from all directions. The amber light shall be mounted on the uppermost part of the Contractor's vehicle. Lights must have peak intensity within the range of 40 to 400 candelas and must flash at 75 ± 15 flashes per minute. Vehicle flasher/hazard lights are not acceptable. All haul trucks shall be equipped with a second flashing amber light that is visible from the backside of the haul truck. The costs for the flashing amber lights shall be incidental to the various related contract bid items.

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

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

16. Temporary Road Markers (Tabs) shall be used for lane closure tapers or lane shift tapers and shall be installed at 5' spacing. Tabs used for tapers and shifts will not be measured for payment. All costs associated to furnish, install, maintain (including replacement as required by the Engineer at no added cost to the Department), and remove all markers will be incidental to the contract lump sum price for Traffic Control, Miscellaneous.

SEQUENCE OF OPERATIONS

- Use Standard Plate No. 634.63 in the eastbound lanes to complete the bridge repair work – the taper shall begin at the Exit 37 off ramp gore point.

TYPE C ADVANCE WARNING ARROW PANEL

The quantity of Type C Advance Warning Arrow Panels paid will be the most installations in place at any one time regardless of the number of setups on the project.

TRUCK OR TRAILER MOUNTED CRASH ATTENUATOR

A Truck or Trailer Mounted Crash Attenuator shall be utilized at the beginning of the work area as depicted in MUTCD Typical Application 33 during hours that workers are present, and shall be removed from the roadway at the end of each working day. A type III Barricade shall be placed in front of the work area in the absence of the Truck or Trailer Mounted Crash Attenuator. The crash attenuator shall meet or exceed NCHRP 350 Test Level 3 criteria or current MASH requirements.

The Attenuator will remain the property of the Contractor at the end of the project. The cost for the Truck or trailer Mounted Crash Attenuator shall be incidental to the contract lump sum price for Traffic Control Miscellaneous.

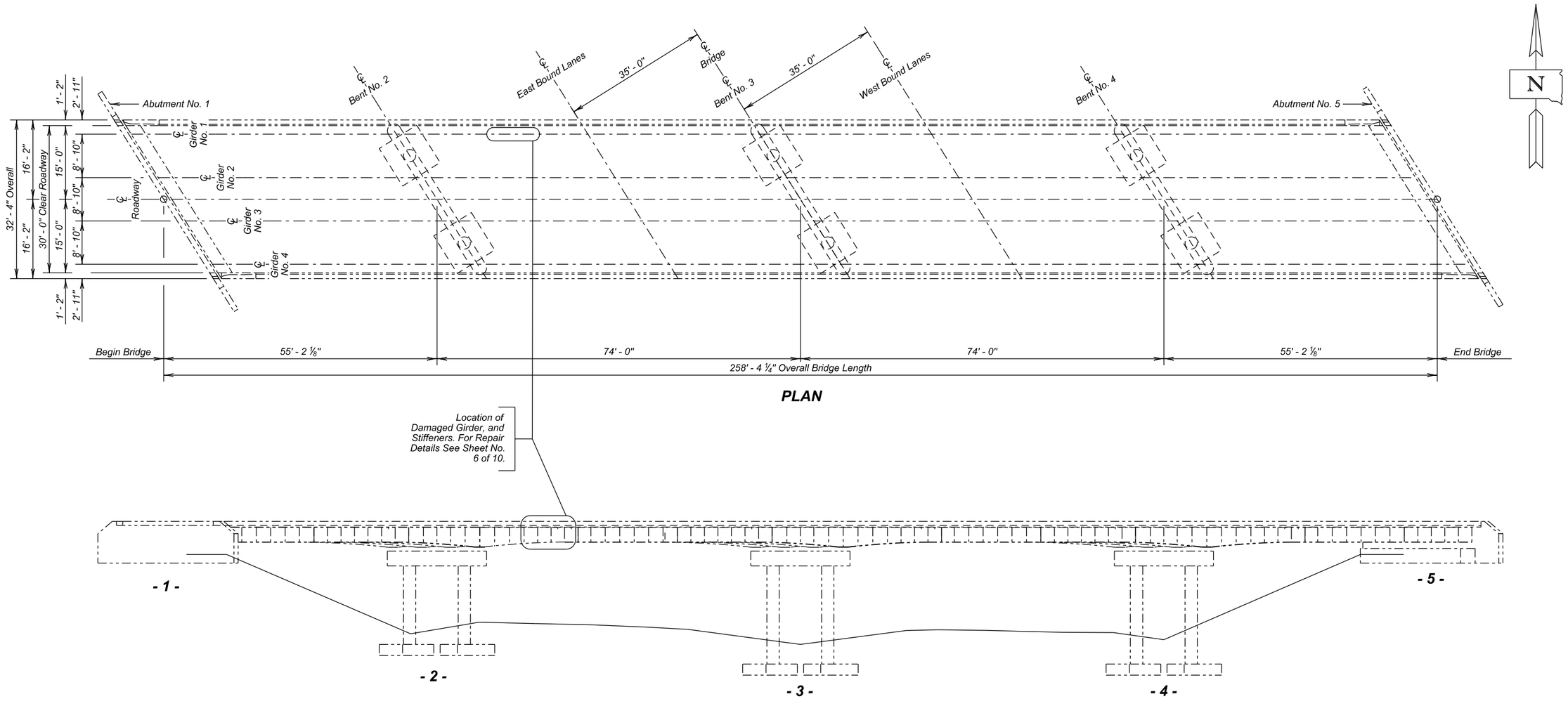
COORDINATION WITH PROJECT IM 0901(188)30 PCN 04VW

A bridge deck repair/overlay project is scheduled to be completed during the 2015 construction season on this same bridge that is to be heat straightened. The Contractor on this project shall coordinate work with the Contractor on the bridge deck repair/overlay project.

INVENTORY OF TRAFFIC CONTROL DEVICES

		EXPRESSWAY / INTERSTATE			
SIGN CODE	DESCRIPTION	NUMBER	SIGN SIZE	UNITS PER SIGN	UNITS
R2-1	SPEED LIMIT __	5	36" x 48"	29	145
R2-6aP	FINES DOUBLE (plaque)	1	36" x 24"	20	20
W3-5	SPEED REDUCTION AHEAD (___MPH)	3	48" x 48"	34	102
W4-2	LEFT or RIGHT LANE ENDS (symbol)	2	48" x 48"	34	68
W20-1	ROAD WORK AHEAD	2	48" x 48"	34	68
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	34	68
W20-7	FLAGGER (symbol)	1	48" x 48"	34	34
G20-2	END ROAD WORK	1	48" x 24"	24	24
-	TYPE 3 BARRICADE - 8' double sided	1		56	56
				TOTAL UNITS	**585**

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	090 E-468	4	15



PLAN

ELEVATION

INDEX OF BRIDGE SHEETS -

GENERAL LAYOUT FOR REPAIRS

FOR

258' - 4¼" CONT. COMP. GIRDER VIADUCT

30' - 0" ROADWAY — 32° SKEW L.H.F.
OVER I.S. NO 90 — SEC. 31/6 - T5/4N - R6E
STR. NO. 47-061-480 — 090 E-468
PCN I3MV

MEADE COUNTY

S. D. DEPT. OF TRANSPORTATION

2015

1 OF 10

PLANS BY :
OFFICE OF BRIDGE DESIGN, SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION

DESIGNED BY	CK. DES. BY	DRAFTED BY	
MM	BWS	KR	Kevin N. Goeden
MEADI3MV	I3MVRA01		BRIDGE ENGINEER

ESTIMATE OF STRUCTURE QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
250E0030	Incidental Work, Structure	Lump Sum	LS
410E0250	Heat Straighten Steel Member(s)	Lump Sum	LS
410E0508	Field Weld	23	In
410E0512	Grind Weld	23	In
410E0515	Drill Hole in Existing Steel	2	Each
410E0520	Surface Grinding of Structural Steel	45	Sq.In
410E3010	Magnetic Particle Weld Inspection	1124	In
410E3030	Magnetic Particle Weld Inspection, Impact Damage Repair	372	Sq.In
412E0100	Bridge Repainting, Class I	Lump Sum	LS
412E0500	Paint Residue Containment	Lump Sum	LS

SPECIFICATIONS

1. Design Specifications: AASHTO Standard Specifications for Highway Bridges 17th Edition using Working Stress Design.

2. Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, 2004 Edition and Required Provisions, Supplemental Specifications and Special Provisions as included in the Proposal.

3. Welding and Welding Inspection shall be in conformance with AASHTO/AWS D1.5M/D1.5:2008 Bridge Welding Code unless otherwise noted in this plan set.

PRE-CONSTRUCTION MEETING

A pre-construction meeting is required prior to beginning the repair work. The purpose of the meeting is to review the plans and procedures because of the specialty work involved. At a minimum, a representative from the Contractor and all Subcontractors shall attend this meeting along with Department personnel from the Area Office and Bridge Office. The contractor must notify the Bridge Construction Engineer and the Area Office at least three days prior to the meeting.

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 and shop 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.

GENERAL CONSTRUCTION

Welder certification shall be in accordance with section 410.3 of the Specifications.

NOTICE – LEAD BASED PAINT

Be advised that the paint on the steel surfaces of the existing structure is a paint containing lead. The Contractor should plan his/her operations accordingly and inform his/her employees of the hazards of lead exposure.

SCOPE OF BRIDGE WORK

All work on this structure shall be accomplished under traffic with the traffic control shown elsewhere in the plans.

1. Provide traffic control per the plans

2. Remove nicks and gouges as directed by Engineer.

3. Nondestructively Test fillet welds, crack tips and potential crack tips at the locations shown in the plans prior to heat straightening.

4. Repair crack tips and weld flaws found by Nondestructive Testing prior to heat straightening.

5. Heat straighten damaged girder G1 including bottom flange, web, and transverse stiffeners as necessary.

6. Nondestructively Test fillet welds, crack tips and potential crack tips at the locations shown in the plans after heat straightening and after all repairs are complete.

7. Repair crack tips and weld flaws found by Nondestructive Testing after heat straightening.

8. Paint all work affected areas.

FIELD WELDING PROCEDURES

1. Approved Welding Procedure Specifications (WPS) will be required for this project, using the Shielded Metal Arc Welding (SMAW) process and an approved E7018 electrode from Table 4.1 of the Bridge Welding Code. The proposed WPS's for this project shall be submitted on Form N-2, from Annex N of the Bridge Welding Code, to the Bridge Construction Engineer for approval at least 2 weeks prior to construction.

2. Preparation of the base metal prior to welding shall be in accordance with Clause 3 of the Bridge Welding Code. Existing Paint shall be removed a distance of 2 inches from each side of the weld.

3. Preheat will be required. Preheat and interpass temperature requirements shall be in accordance with Clause 4.2 of the Bridge Welding Code. The minimum preheat and interpass temperature shall be 320 degrees F for welds to the 3/4" girder flange and 300 degrees F for welds to the 5/16" girder web as determined from Annex G of the Bridge Welding Code for high restraint conditions. Temperature indicating crayons shall be the minimum acceptable method for monitoring preheat and interpass temperatures.

4. SMAW electrode atmospheric exposure requirements shall comply with Clause 4.5 of the Bridge Welding Code. Electrodes shall be purchased in hermetically sealed containers. If the container shows evidence of damage, the electrodes shall be dried in a drying oven for at least one hour at temperatures between 700 and 800 degrees F before they are used. Immediately after opening a hermetically sealed container or removal of the electrodes from a drying oven, electrodes shall be stored in ovens at a temperature of at least 250 degrees F. Electrodes exposed to the atmosphere upon removal from drying or storage ovens or hermetically sealed containers shall be used within four hours maximum or redried at 450 to 550 degrees F for two hours minimum. Electrodes exposed to the atmosphere for periods less than four hours may be returned to a storage oven and maintained at a minimum of 250 degrees F for a minimum of four hours before reissue. Electrodes shall be redried no more than one time. Electrodes which have been wet shall not be used.

5. All welds shall be cleaned in accordance with Clause 3.11 of the Bridge Welding Code. Completed welds and adjacent areas shall be cleaned of all weld splatter, slag, smoke and heat affected paint. No intermittent "stitch" welds will be allowed.

6. E7018 electrodes shall be used for tack welds. The size of tack welds shall not be greater than 5/16". Tack welds shall be positioned so they will incorporate into, and re-melt by, the final weld. This applies to run-off tabs also. Tack welds shall be thoroughly cleaned prior to any weld placement.

7. Groove joint fit-up tolerances shall be +1/16", -1/8" for root opening and +10º, -5º for the bevel angle for Joint Designation B-U2 as per Clause 3.3.4 of the Bridge Welding Code. The removal dimensions of the damaged web material and the dimensions of the new web plates shall be closely controlled to achieve the specified fit-up tolerances. All groove welds shall be ground to a flush contour. Grinding shall be longitudinal. Transverse grinding will not be allowed.

ESTIMATE OF STRUCTURE QUANTITIES AND NOTES

FOR

258' - 4¼" CONT. COMP GIRDER VIADUCT

STR. NO. 47-061-480

MARCH 2015

DESIGNED BY	CK. DES. BY	DRAFTED BY	
MM	BWS	KR	Kevin N. Goeden BRIDGE ENGINEER
MEADI3MV	I3MVRA01		

WELD INSPECTION & NONDESTRUCTIVE TESTING (NDT)

1. The Contractor shall be responsible for retaining a qualified Testing Agency to perform Visual, Magnetic Particle (MT), and Ultrasonic (UT) inspection of existing and new welds and to locate existing and potential crack tips. Inspectors performing Visual, MT and UT inspection and crack tip location shall be certified in accordance with Section 410.3.D of the Construction Specifications. The Contractor shall submit the Testing Agency to the Department at the Preconstruction meeting for approval by the Bridge Construction Engineer.

2. All Nondestructive Testing (NDT) and inspection shall be done in accordance with Clause 6 of the Bridge Welding Code. The MT inspection shall be performed by the yoke method using half-wave rectified direct or alternating current. Existing paint shall be removed from the steel surfaces that require NDT. MT inspection results shall be reported on Form N-7 of Annex L and UT results shall be reported on Form F-4 of Annex F of the Bridge Welding Code.

3. The existing fillet welds noted below shall be 100% visually inspected and 100% magnetic particle inspected. In addition, all of the structural steel elements in the length of girder shown in the heat straightening zone of the plans shall be visually inspected for possible cracks. Defects shall be clearly marked on the girder in accordance with the Bridge Welding Code and a written record of the defects shall be given to the Engineer for transmittal to the Bridge Construction Engineer. Any suspected cracks shall be verified by magnetic particle inspection with the crack tips located. Crack tip locations shall be clearly marked on the girder and a written record of the crack tip location shall be given to the Engineer for transmittal to the Bridge Construction Engineer. Notify the Bridge Construction Engineer if any cracks or crack tips are located in the girder flange.

   Testing for defects and crack tips shall be made prior to any heat straightening. Repair options for the defects and crack tips shall be determined by the Bridge Construction Engineer—see note on REPAIRS FOR NDT DETERMINED FLAWS. Repairs shall be made prior to any heat straightening.

4. Existing fillet weld MT testing locations

   Girder 1:

   a. Test the bottom flange to web weld on both sides of the web, 17.42’ from existing diaphragm, location shown on Sheet No. 6 of 10 for an estimated 418 linear inches

   b. On the six affected transverse stiffeners and two diaphragm connection plates, test the welds and stitch welds to web (bottom 12”) on both sides and at diaphragms test bottom flange to stiffener welds for an estimated linear 144 inches.

   c In the impact area of the bottom flange, test a 1.0 foot section of bottom flange for an estimated 186 square inches. The 1.0 foot section is an estimate and may be adjusted in the field as approved by the Bridge Construction Engineer.

5. After heat straightening, secondary cracks that develop will require MT weld inspection. The areas listed above shall be retested to ensure no additional cracks have developed. The estimated weld length and area for re-testing is 562 linear inches and 186 square inches.

6. New fillet welds shall be 100% visually inspected and 100% magnetic particle inspected. Based on the results of the magnetic particle and visual inspection, the Bridge Construction Engineer will determine the acceptability of the completed fillet welds and any recommended repairs. Reject able defects in new welds shall be repaired in accordance with the Bridge Welding Code. Repaired welds shall be re-inspected after all repairs are complete.

7. All costs including labor, equipment and any incidentals necessary to perform the visual inspection, magnetic particle inspection and crack tip location shall be incidental to the contract unit price per inch for MAGNETIC PARTICLE WELD INSPECTION.

8. All costs including labor, equipment and any incidentals necessary to perform the visual inspection, magnetic particle inspection and crack tip location shall be incidental to the contract unit price per square inch for MAGNETIC PARTICLE WELD INSPECTION, IMPACT DAMAGE REPAIR.

9. All costs to remove the paint and clean all fillet welds to be non destructive tested and remove the paint and clean all visible or potential crack tip locations shall be incidental to the contract unit price per inch for MAGNETIC PARTICLE WELD INSPECTION or contract unit price per square inch for MAGNETIC PARTICLE WELD INSPECTION, IMPACT DAMAGE REPAIR.

11. The total plans quantity for MT is only an estimate. The weld inspection will be measured and paid for as MAGNETIC PARTICLE WELD INSPECTION or MAGNETIC PARTICLE WELD INSPECTION, IMPACT DAMAGE REPAIR.

REPAIRS FOR NDT DETERMINED FLAWS

1. Repair options for weld defects and crack tips shall be determined by the Bridge Construction Engineer. Two repair options are:

   a. Drill all crack tips in the web to 1” diameter.

   b. Repair fillet weld defects by removing the weld with air carbon arc process and then grinding flush. Grinding shall be in the longitudinal direction. Transverse grinding will not be allowed. The repair shall then be re-welded in accordance with the Bridge Welding Code.

2. All labor, equipment, materials and incidentals necessary to drill 1” diameter holes in the web shall be incidental to the contract unit price per each for “Drill Hole in Existing Steel”.

3. All labor, equipment, materials and incidentals necessary including air carbon arc removal and grinding of welds shall be incidental to the contract unit price per inch for “Grind Weld”.

4. All labor, equipment, materials and incidentals necessary to re-weld the repair shall be incidental to the contract unit price per inch for “Field Weld”.

5. Other repair options shall be at the discretion of the Bridge Construction Engineer.

NOTES (CONTINUED)

FOR

258' - 4¼" CONT. COMP. GIRDER VIADUCT

STR. NO. 47-061-480

MARCH 2015

DESIGNED BY	CK. DES. BY	DRAFTED BY	
MM	BWS	KR	Kevin N. Goeden BRIDGE ENGINEER
MEADI3MV	I3MVRA01		

AIR CARBON ARC CUTTING AND GOUGING

1. All removal of web sections, transverse stiffeners, diaphragm gusset plates, and welds called for by the plans shall be accomplished using the air carbon arc process unless noted otherwise. Plasma cutting will be allowed. If the contractor plans to use plasma cutting the Bridge Construction Engineer shall be notified and will provide the Contractor with additional requirements for this cutting method.

2. Before any air carbon arc cutting or gouging begins, lay out all cut lines on the steel surfaces using a marker that will be visible during the cutting process.

3. When grinding to a specified shape or dimension is required after air carbon arc cutting, lay out the shape on the steel surface with a visible marker and grind to the layout line. Air carbon arc gouging shall be done using DC, electrode positive.

4. Extreme care shall be exercised during the cutting or gouging process so that absolutely no damage (such as nicks, gouges, splattering) to the surrounding metal occurs. Any damage caused by the air carbon arc process shall be repaired by the Contractor to the satisfaction of the Engineer at no cost to the Department.

5. Grind all surfaces cut or gouged with the air carbon arc process to remove high carbon deposits, provide a smooth finish, and prepare metal for welding and/or to accept paint.

HEAT STRAIGHTENING

1. This Contract includes heat straightening of steel girders including bottom flange, web, and stiffeners. Heat straightening is considered specialty work for which only the following contractors are allowed to do. Contact:

   Judd Holt
   International Straightening Incorporated
   901 E. Bristol Drive
   Bismarck, ND 58501
   Telephone (701) 223-5972 or (701) 751-1683
   Fax (701) 751-1683
   E-mail isisteel@gmail.com
   www.steelstraightening.com

   Darryl Thomas
   Flame On, Inc.
   4415 Tom Marks Road
   Snohomish, WA 98290
   Telephone (425) 397-7039
   Fax (425) 397-7002
   Cellular (425) 501-9855
   www.flameoninc.com

2. The equipment used for heat straightening shall be an oxygen-fuel combination. The fuel shall be propane or acetylene. The application of heat shall be by single or multiple orifice tips only. The size of the tip shall be proportional to the thickness of the heated material. As a guide, the following table shows the recommended tip sizes.

Steel Thickness (in)	Orifice Type	Size
< 1/4	Single	3
3/8	Single	4
1/2	Single	5
5/8	Single	7
3/4	Single	8
1	Single Rosebud	8 3
2	Single Rosebud	8 4
3	Rosebud	5
>4	Rosebud	5

3 The temperature of all steel during heat straightening shall not exceed 1,200°F. The Contractor shall use one or more of the following methods for verifying temperatures during heat straightening:

   a. Temperature sensitive crayons

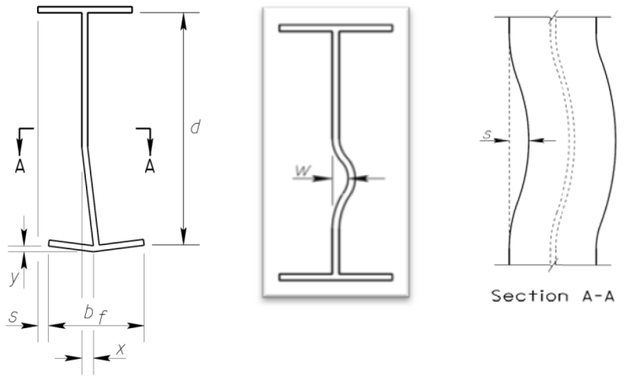
   b. Pyrometer

   c. Infrared non-contact thermometer

   Material should be heated in a single pass and shall be allowed to air cool to below 250°F prior to re-heating.

4 Hot Mechanical Straightening and Hot Working will NOT be allowed.

5. The final dimensions of heat straightened structural members shall conform to the following tolerances:



d = original depth of web
b_f = original width of flange

x = final displacement of web ≤ maximum of $\frac{d}{100}$ or ¼"

y = final displacement of edge of flange ≤ ¼"
w = maximum final local deformation in web ≤ ¼"
s = sweep of flange from original edge of flange ≤ ½" over 20 ft

6. All labor, materials, equipment, and any incidentals necessary to perform the required heat straightening shall be incidental to the contract lump sum price for "Heat Straighten Steel Member(s)".

REMOVAL OF SURFACE NICKS AND GOUGES

1. Grind the bottom flange of Girder G1, as directed by the Engineer, to remove all sharp edges from surface nicks and gouges created by vehicle impact. The amount of material removed shall be kept at the absolute minimum necessary to remove the sharp edges and to minimize the section reduction of the existing structural members. Grinding shall be longitudinal. Transverse grinding will not be allowed. The grinding shall be done prior to heat straightening the girder.

2. All surface nicks and gouges shall be checked by nondestructive MT testing after grinding – see Weld Inspection & Nondestructive Testing (NDT) note. Repair options for the defects found by the nondestructive testing shall be determined by the Bridge Construction Engineer.

3. All costs associated with removing sharp edges from surface nicks and gouges including materials, equipment and labor shall be incidental to the contract unit price per square inch for "Surface Grinding of Structural Steel". Estimated quantity is 45 square inches. The quantity is included to establish bid prices. "Surface Grinding of Structural Steel" will be used and paid for only as determined by the Engineer.

NOTES (CONTINUED)
FOR
258' - 4¼" CONT. COMP. GIRDER VIADUCT

STR. NO. 47-061-480
MARCH 2015

DESIGNED BY	CK. DES. BY	DRAFTED BY	
MM	BWS	KR	Kevin N. Goeden BRIDGE ENGINEER
MEADI3MV	I3MVRA01		

INCIDENTAL WORK (STRUCTURE)

1. Power tool cleaning shall be performed by the Contractor in preparation for Nondestructive Testing. Power tool cleaning shall be in accordance with SSPC SP-3.

2. All materials, labor, and equipment necessary to perform work that is described in the notes above shall be included in the contract lump sum price for “Incidental Work, Structure”.

PAINT RESIDUE REMOVAL AND CONTAINMENT

1. Paint removal on the existing bridge shall be in accordance with Section 412 of the Construction Specification except as modified by these notes.

2. The Contractor shall plan his operations to prevent releases of lead-containing material and other particulate matter into the surrounding air, water, and onto the ground, soil, slope protection, and pavement. The Contractor shall be responsible for any corrective actions should a spill occur.

3. Collect all visible paint particles and blasting residue containing paint at the end of each workday from the work area. Inspect outside the containment and collect any paint particles or blasting residue that escaped the work area. Collect waste material by manual means, vacuum, or another method approved by the Engineer. Do not use air pressure or streaming water to assist in the waste collection process that could disperse the waste material.

4. In the event of a spill or inadvertent release, the Contractor shall immediately stop work, notify the Engineer, and report the release to the South Dakota Department of Environmental and Natural Resources (DENR). The Contractor shall be responsible for completing a spill reporting form and for all costs associated with appropriate corrective actions.

   To report a release or spill, call DENR at (605) 773-3296 during regular office hours (8 a.m. to 5 p.m. Central time). To report the release after hours, on weekends or holidays, call State Radio Communications at (605) 773-3231. Reporting the release to DENR does not meet any obligation for reporting to other state, local, or federal agencies. Therefore, the Contractor must also contact local authorities to determine the local reporting requirements for releases. DENR recommends that spills also be reported to the National Response Center at (800) 424-8802.

5. The Contractor shall haul and unload the 55 gallon containment drums with paint residue, blasting media, etc. at the SDDOT Maintenance Yard located in Rapid City for temporary storage. All costs associated with this work shall be included in the contract lump sum price for “Paint Residue Containment”.

6. If the Contractor elects to use containers other than 55 gallon barrels to hold paint residue, the Contractor shall be responsible for all testing and disposal at a permitted regional landfill. The Contractor shall be responsible for compliance of laws and regulations regarding storage, handling and shipping. Copies of all tests shipping and disposal documents shall be provided to the Office of Bridge Design.

BRIDGE REPAINTING, CLASS I

1. All work affected areas shall be painted. The exact area to be painted will not be known until all heat straightening is completed. The intent in the heat straightened area is to paint the entire girder face for a distance of 6 inches outside of the outer edges of the heat straightening limits. The finished girder in the heat straightened area shall have a uniform paint appearance as approved by the Engineer. For informational purposes, the approximate total area under this item of repair is 65 square feet. This informational quantity assumes the area between the second and third diaphragms on girder 1, Span 2, will be affected. The actual work affected area will only be known after all of the non-destructive testing and heat straightening is complete.

2. Painting shall be in accordance with Section 412 of the Specifications and in accordance with SSPC Standard PA1.

3. Paint color

   Top Coat – The paint color shall be an approved green color to match the existing paint. Prior to ordering the paint, a paint chip of the green color shall be submitted to the Department for color approval.

   Primer or Intermediate Coats – Colors shall sharply contrast with each other and with the top coat.

NOTES (CONTINUED)

FOR

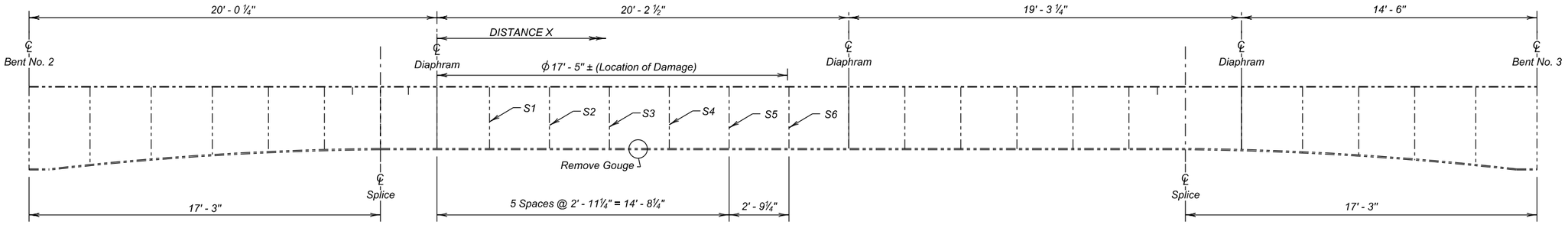
258' - 4¼" CONT. COMP. GIRDER VIADUCT

STR. NO. 47-061-480

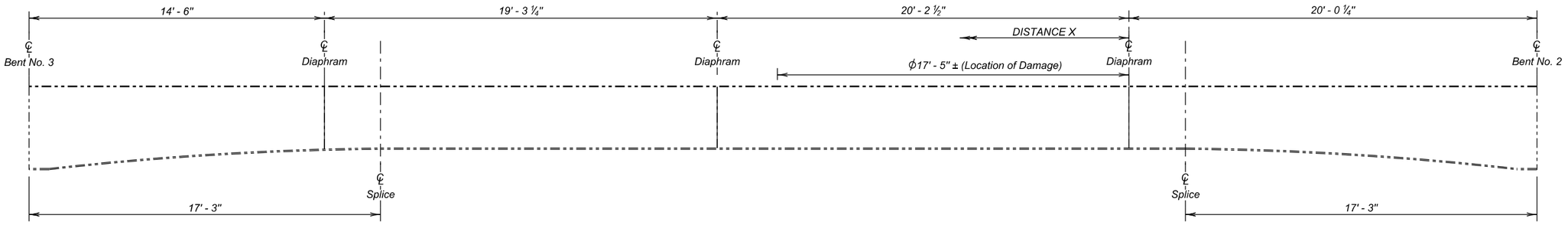
MARCH 2015

DESIGNED BY	CK. DES. BY	DRAFTED BY	
MM	BWS	KR	Kevin N. Goeden BRIDGE ENGINEER
MEADI3MV	I3MVRA01		

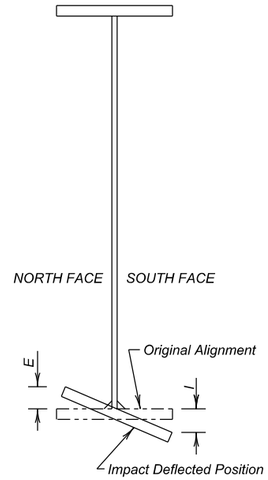
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	090 E-468	9	15



GIRDER NO. 1 - SOUTH FACE
SPAN 2



GIRDER NO. 1 - NORTH FACE
SPAN 2



TYPICAL SECTION
(at Damaged Location)

GIRDER NO. 1 SOUTH FACE IMPACT DEFLECTED POSITION MEASUREMENTS

DISTANCE X	I ⚹
0'	0"
1.0'	- ⅛"
2.0'	- ½"
S1	- 1"
3.93'	- 1⅛"
4.93'	- ⅞"
S2	- ¾"
6.86'	- ⅝"
7.86'	- ½"
S3	- ⅜"
9.79'	- ¼"
10.79'	- ¼"
S4	- ⅛"
12.72'	- ⅛"
13.72'	- ⅛"
S5	- ⅛"

GIRDER NO. 1 NORTH FACE IMPACT DEFLECTED POSITION MEASUREMENTS

DISTANCE X	E ⚹
0'	- ⅛"
1.0'	+ ⅛"
2.0'	+ 1 ⅜"
3.0'	+ 1 ⅞"
4.0'	+ 1 ½"
5.0'	+ ⅞"
6.0'	+ ¾"
7.0'	+ ⅝"
8.0'	+ ½"
9.0'	+ ½"
10.0'	+ ⅜"
11.0'	+ ⅜"
12.0'	+ ¼"

ESTIMATED QUANTITIES

	ITEM	UNIT	QUANTITY
◈	Field Weld	In.	23
◈	Grind Weld	In.	23
◈	Drill Hole In Existing Steel	Each	2
	Surface Grinding In Structural Steel	Sq. In.	45
	Magnetic Particle Weld Inspection	In.	1124
	Magnetic Particle Weld Inspection, Impact Damage Repair	Sq. In.	372

◈ *Field Weld, Grind Weld, and Drill Hole in Existing Steel may not be encountered and may be removed from the project at the direction of the Engineer.*

NOTES:

⚹ *Approximate distance between top of bottom flange in original alignment and top of bottom flange in deflected position. Positive indicates a upward distortion. Negative indicates a downward distortion. See Typical Section.*

ϕ *Heat straighten girder bottom flange. Girder web & stiffeners will be heat straightened as neccessary*

Concrete deck not shown for clarity

GIRDER NO. 1 REPAIR

FOR

258' - 4¼" CONT. COMP. GIRDER VIADUCT

30' - 0" ROADWAY
OVER I.S. NO 90
STR. NO. 47-061-480

32° SKEW L.H.F.
SEC. 31/6 - T5/4N - R6E
090 E-468

MEADE COUNTY

S. D. DEPT. OF TRANSPORTATION

2015

DESIGNED BY	CK. DES. BY	DRAFTED BY	
MM	BWS	KR	Kevin N. Goeden
MEADI3MV	I3MVRA06		BRIDGE ENGINEER

47034

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 090E-468	10	15

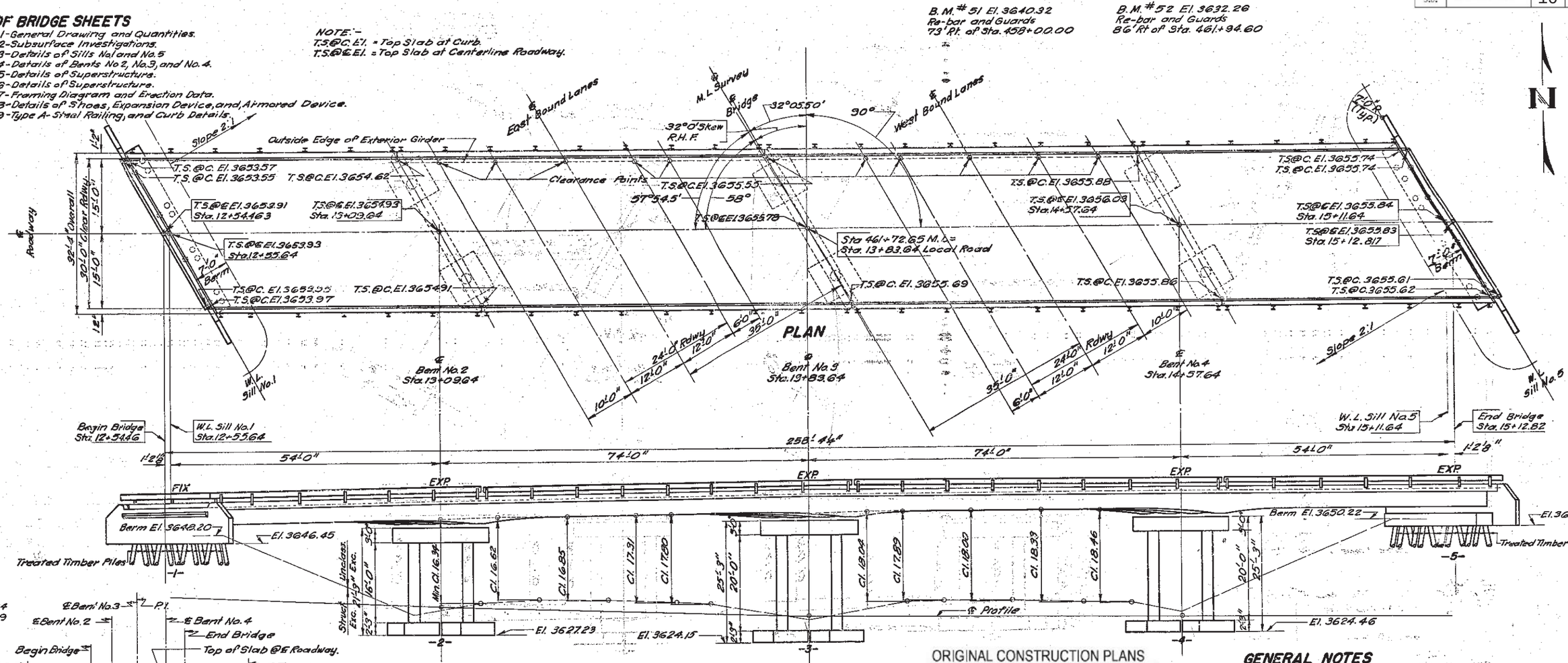
-X771-

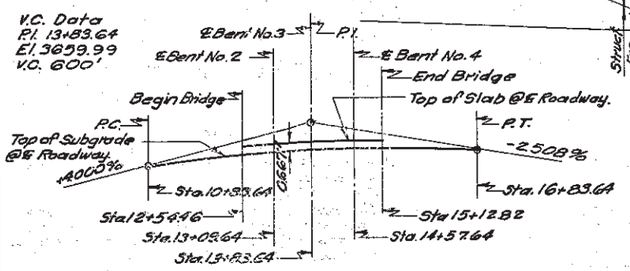
INDEX OF BRIDGE SHEETS

NOTE:-
T.S.@C. El. = Top Slab at Curb.
T.S.@℄ El. = Top Slab at Centerline Roadway.

B.M. # 51 El. 3640.32
Re-bar and Guards
73' Rt. of Sta. 458+00.00

B.M. # 52 El. 3632.26
Re-bar and Guards
86' Rt of Sta. 461+94.60





SUBGRADE CURVE DATA

ELEVATION

ORIGINAL CONSTRUCTION PLANS

STR. NO. 47-061-480

SPECIFICATION NOTE:-

Use current South Dakota Standard Specifications for Roads and Bridges, and the Supplemental Specifications as included in the proposal.

EXCAVATION NOTES:-

1. After footing excavations for Bents No.2, No.3 and No.4 are to size and down to footing elevations, any depressions (below footing elevations) caused by removal of boulders, shall be filled with fine portions of the gravel removed from the excavations and thoroughly compacted as replaced. A very wet 1:2 cement: sand, cement mortar shall then be poured into and allowed to run into voids of the gravelly material until filled and the surface then floated smooth at footing elevation to stabilize the foundation material.
2. Foundation material shall develop a minimum bearing value of 3.75 tons per sq. Ft. If bearing value is less than 3.75 tons per sq. ft. communicate with the BRIDGE DIVISION.
3. Final footing elevation for Bents No.2, No.3, and No.4 shall be established, before ordering column reinforcing for the respective bents.
4. The cost of sand mortar (Item 1. above) shall be included in the unit price bid for structure excavation.

ESTIMATED QUANTITIES

ITEM	Cl."A" Concrete Cu. Yds.	Steel-Lbs. Reinf.	Steel-Lbs. Struct.	Type-A Steel Railing-Lin. Ft.	Timber Piles-Lin. Ft. Treated	Timber Piles-Lin. Ft. Test	Steel Pile Shoes-No.	Excavation-Cu Yds. Struct.	Excavation-Cu Yds. △Unclass.
Superstructure	187.6	51000	141985	519.0	180	19		25	26.49
Sill No.1	28.7	2620		40	1@25'=25' 1@30'=30'	1@30'=30'	0	40	43.64
Sill No.5	28.5	2620		40	1@35'=35'	1@40'=40'	0	40	43.64
Bent No.2	30.2	6225			247	40		50	83.15
Bent No.3	31.6	6730						50	71.72
Bent No.4	31.6	6730			542	59		50	71.72
Totals	338.2	82005	141985	519.0	660	78	24	190	257.26

#One Treated Timber Test Pile shall be driven at Sills No.1 and No.5 before remaining piles are ordered.
△See Grading Plans for Unclassified Excavation.
PILE NOTE:- Piles driven at Sills No.1 and No.5, including test piles, shall obtain their full bearing (24 Tons) in the natural ground below the new embankments elevations 3634.00± and 3627.00± respectively. Pre-boredholes thru the Fill are required and shall have a minimum diameter 2" larger than the nominal diameter (3' from the butt) of pile.
★All-Steel Pile shoes as approved by the ENGINEER shall be used.

F.E. 3.2 + 1.2

GENERAL NOTES

1. Rail Post shall be built vertical.
2. Longitudinal elements of the slab shall conform to the vertical curve.
3. Omit all Floor Drains.
4. Surface finish, sec. 46.3.x.(3) of current South Dakota Standard Specifications, shall also include such portions of the structure which are visible from any traveled lane.

GENERAL DRAWING AND QUANTITIES
FOR
258'-4 1/4" CONT. COMP. GIRDER VIADUCT

30'-0" ROADWAY — 32° SKEW R.H.F.
OVER I.S. NO. 90 STA. 461+72.65 SEC. 31/6-T5/4N-R6E
STA. 12+54.463 TO STA. 15+12.817 — I 90-I( )28
MEADE COUNTY — H20-S16-44
SOUTH DAKOTA
DEPARTMENT OF HIGHWAYS
FEB. 1962 (7) OF (10)

-X771-

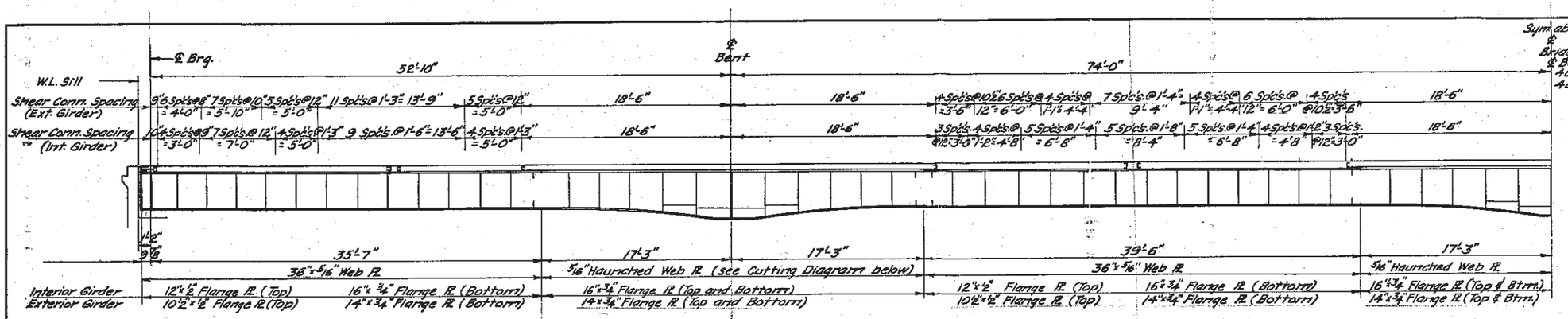
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
	M.V.W.	R.K.	BRIDGE ENGINEER

47-061-480

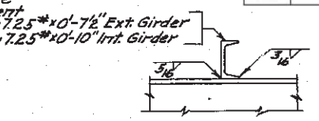
Group VI

41034

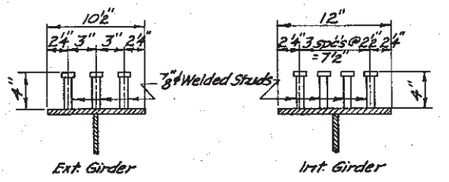
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 090E-468	11	15



GIRDER LAYOUT



CHANNEL SHEAR CONNECTOR



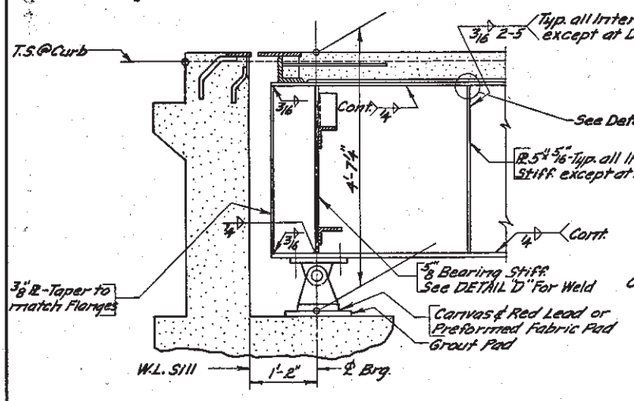
WELDED STUD SHEAR CONNECTORS
SHEAR CONNECTOR DETAILS

The Contractor may substitute a row of 7/8"ϕ welded studs for each channel shear connector as shown.
Channel or welded stud shear connectors are spaced as shown on Girder Layout.
Shear connectors will be paid for as structural steel based on the weight of channels, regardless of type of connector used.

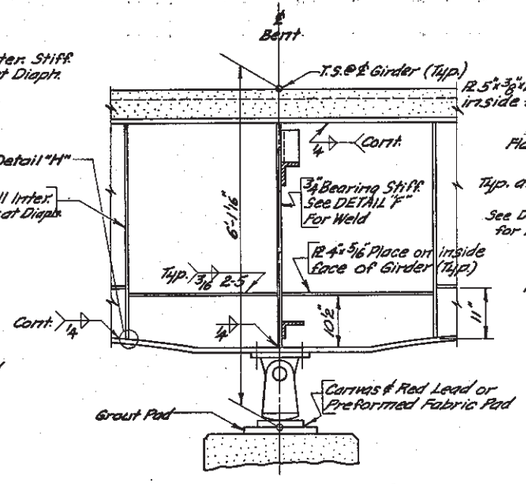
DETAIL "H"

Bottom flange shall be considered compression flange at haunched section between field splices. Top flange shall be considered compression flange in all other sections.

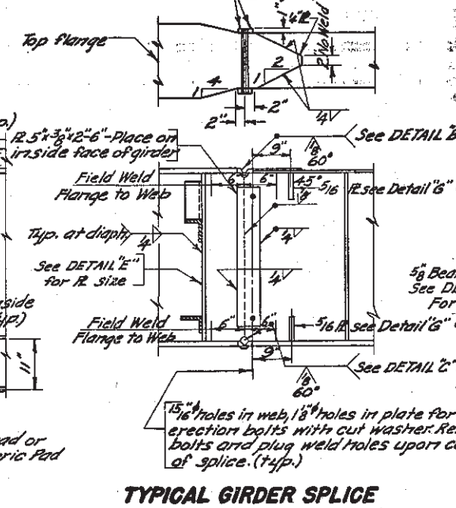
NOTE: When stiffener plates are used on one side only, they shall be attached to the outstanding leg of the compression flange as shown in Detail "H", except at splices use Detail "G"



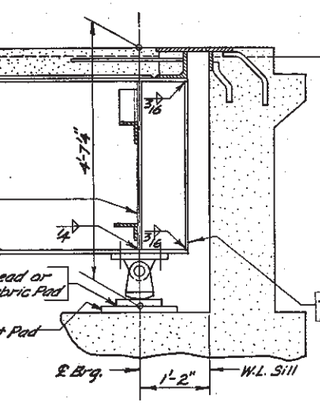
SECTION AT SILL NO. 1



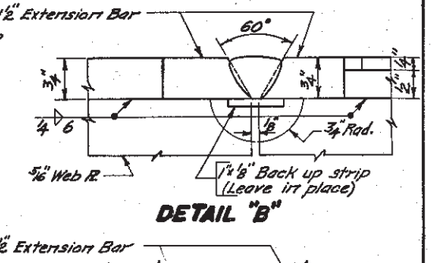
SECTION AT BENTS NO. 2,3, OR 4



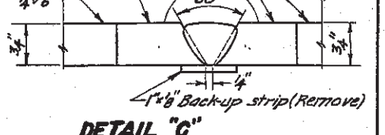
TYPICAL GIRDER SPLICE



SECTION AT SILL NO. 4

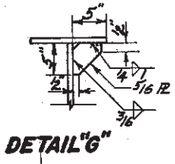


DETAIL "B"



DETAIL "C"

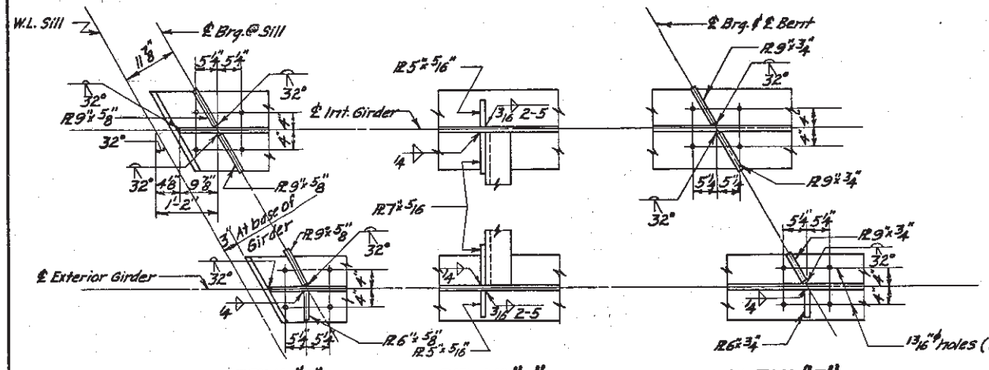
NOTE—
All flange welds shall start and stop on extension bars. After weld is completed, extension bars shall be burned off flush. The bars shall be of mild steel.



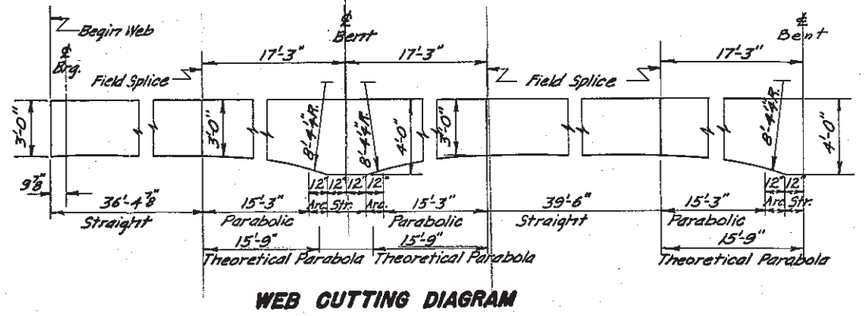
DETAIL "G"

Place on inside face of Girder, either side of splice, as shown on sheet 7 of 9, or as otherwise needed.

NOTE: At ends, Top & Bottom flanges to be 90° to Web.



DETAIL "D"
DETAIL "E"
DETAIL "F"



WEB CUTTING DIAGRAM

ORIGINAL CONSTRUCTION PLANS

STR. NO. 47-061-480

DETAILS OF SUPERSTRUCTURE
FOR
258'-4 1/4" CONT. COMPOSITE GIRDER VIADUCT

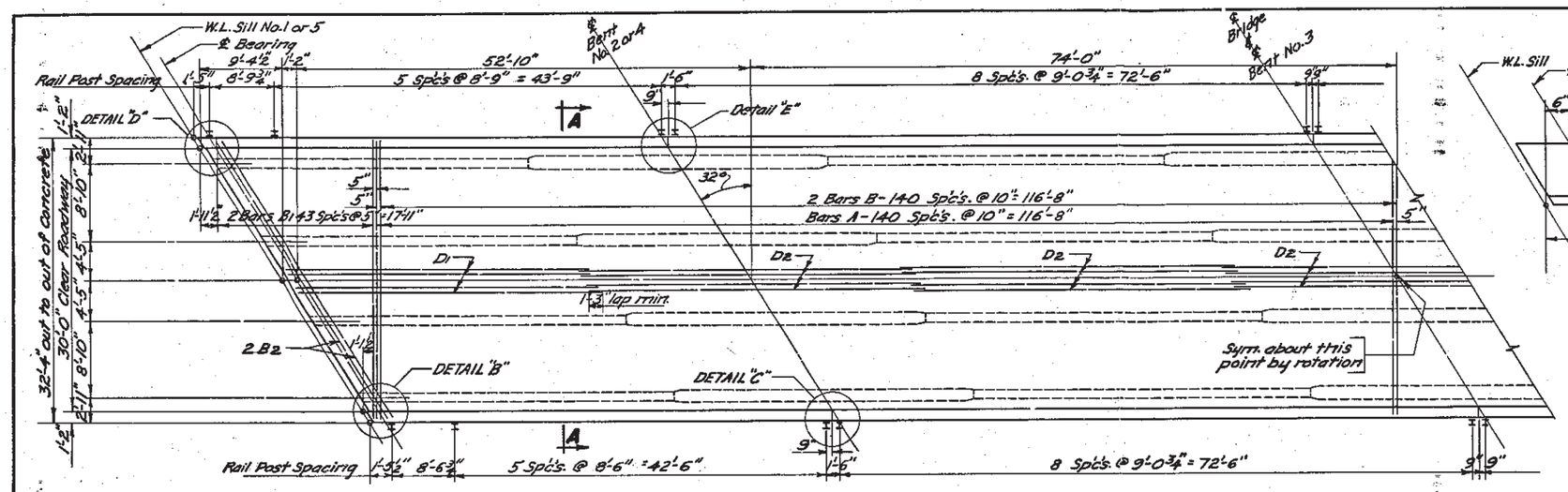
30'-0" ROADWAY — 32° SKEW R.H.F.
OVER I.S. NO. 90 STA. 461+72.65 — SEC. 31/6-T5/4N-R6E
STA. 12+54.463 TO STA. 15+12.817 — 190-1( )28
MEADE COUNTY — H20-S16-44

SOUTH DAKOTA
DEPARTMENT OF HIGHWAYS
JANUARY 1962 (8) OF (10)

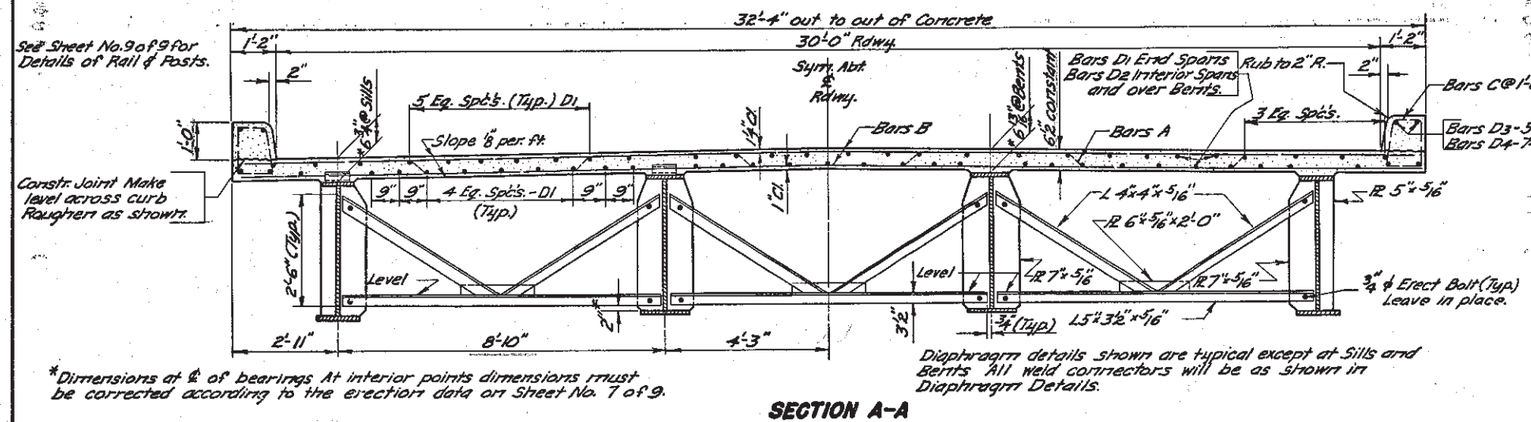
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
	F.M. 7-84 W.C.P.	R.K.S. Ind.	BRIDGE ENGINEER

4/1034

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 090E-468	12	15



HALF PLAN



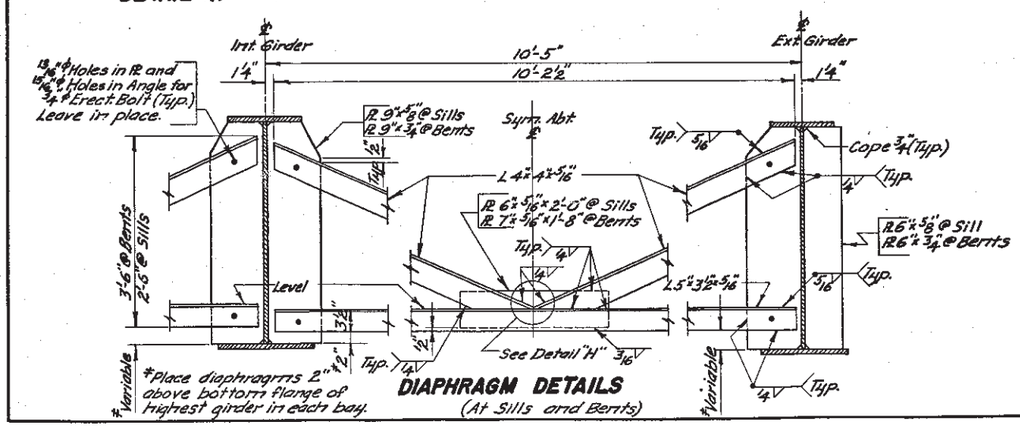
*Dimensions at ℄ of bearings At interior points dimensions must be corrected according to the erection data on Sheet No. 7 of 9.

Diaphragm details shown are typical except at Sills and Bents. All weld connectors will be as shown in Diaphragm Details.

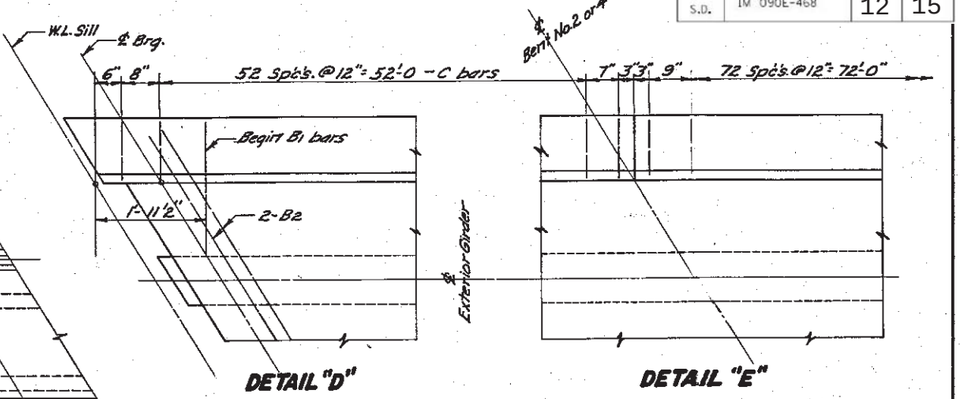
SECTION A-A

DETAIL "H"

NOTE—
The Concrete slab Shall preferably be placed in one Continuous pour However, if the Contractor deems it advisable to use Construction Joints, a plan showing type of joint and pouring procedure shall be Submitted to the BRIDGE DIVISION for Approval. The curb shall be poured after all of the slab has been poured.



DIAPHRAGM DETAILS
(At Sills and Bents)

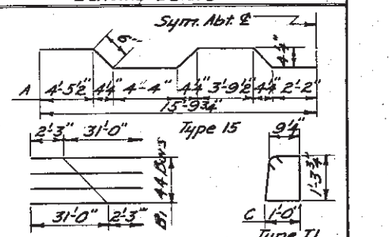


DETAIL "D" **DETAIL "E"**

REINFORCING SCHEDULE

MK.	No.	Size	Length	Type
A	282	6	32'-6"	15
B	562	5	32'-0"	Str.
B1	88	6	33'-3"	Str.
B2	8	5	37'-9"	Str.
C	518	4	5'-6"	T1
D1	122	5	35'-0"	Str.
D2	305	5	39'-0"	Str.
D3	16	5	27'-0"	Str.
D4	16	5	38'-0"	Str.

Bending Details



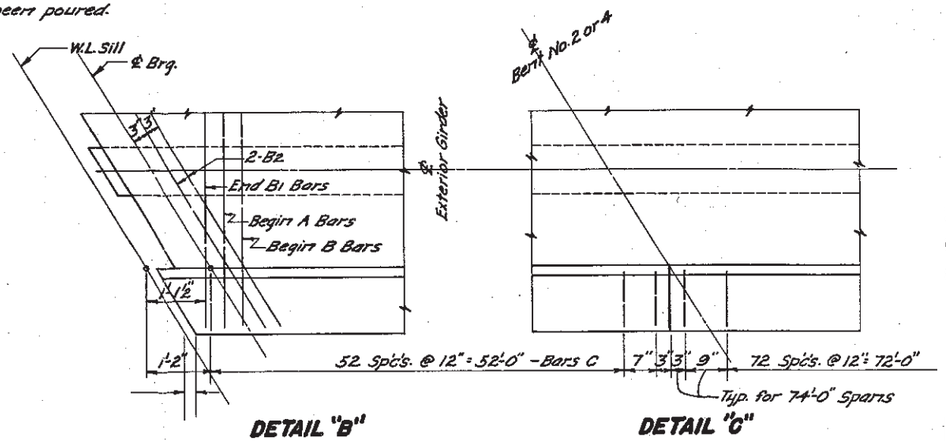
All dimensions are out to out of bars.

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY
Class "A" Concrete	Cu. Yds.	187.6
Reinforcing Steel	Lbs.	57080
Structural Steel	Lbs.	141885
Type "A" Steel Railing	Lin. Ft.	519.0

ORIGINAL CONSTRUCTION PLANS

STR. NO. 47-061-480



DETAIL "B" **DETAIL "C"**

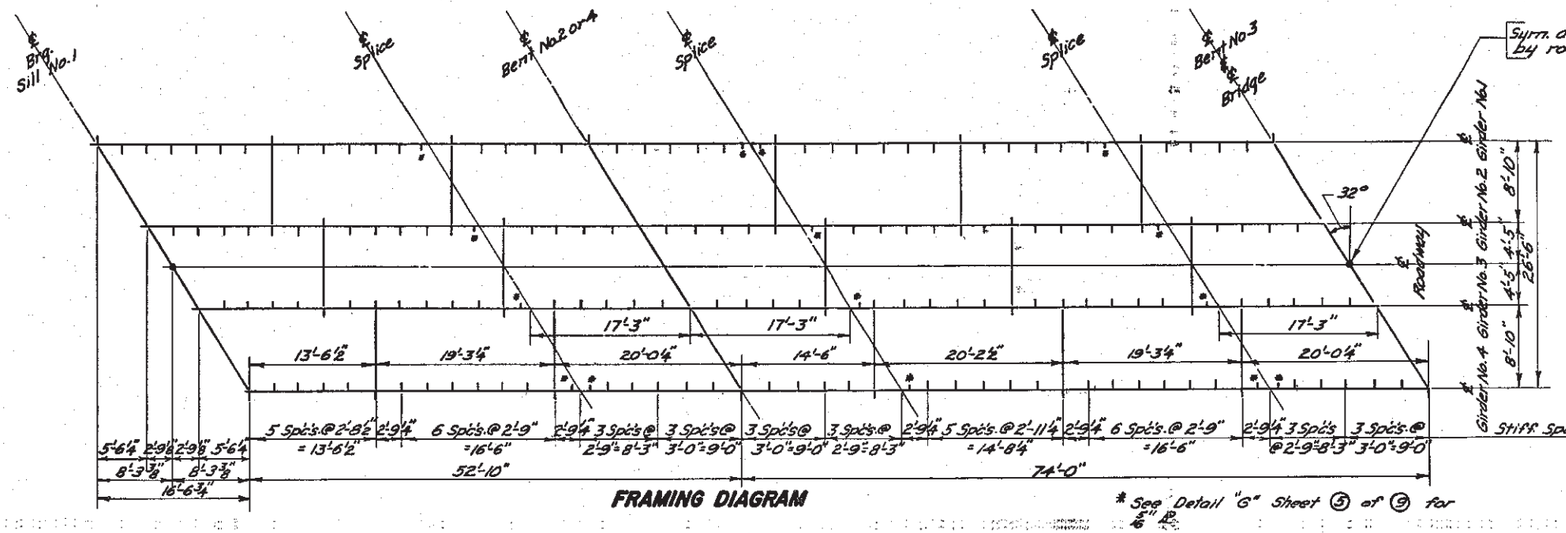
DETAILS OF SUPERSTRUCTURE
FOR
258'-4¼" CONT. COMP. GIRDER VIADUCT

30'-0" ROADWAY — 32° SKEW R.H.F.
OVER I.S. NO. 90 STA. 461+72.65 SEC. 31/6-T5/4N-R6E
STA. 12+54.463 TO STA. 15+12.817 190-1( )28
MEADE COUNTY
SOUTH DAKOTA H20-S16-44
DEPARTMENT OF HIGHWAYS
JANUARY 1962 (9) OF (10)

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
	F.M. Tr. By W.C.F.	R.K. & T.J.	BRIDGE ENGINEER

4-70134

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 090E-468	13	15



FRAMING DIAGRAM

* See Detail "G" Sheet ⑤ of ⑨ for ℄ ℄

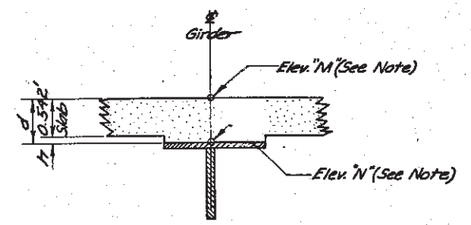


TABLE OF SLAB FORM ELEVATIONS AND COMPUTATIONS

		⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯
Girder No.1	Elev. M	3653.640	3653.950	3654.216	3654.449	3654.657	3654.964	3655.231	3655.421	3655.573	3655.731	3655.850	3655.891	3655.894	3655.907	3655.895	3655.849	3655.760
	(-) Elev. N																	
	(=) d																	
	(-) 0.542																	
	(=) h																	
Girder No.2	Elev. M	3653.852	3654.154	3654.413	3654.638	3654.838	3655.133	3655.390	3655.569	3655.709	3655.856	3655.964	3655.994	3655.986	3655.991	3655.971	3655.917	3655.821
	(-) Elev. N																	
	(=) d																	
	(-) 0.542																	
	(=) h																	
Girder No.3	Elev. M	3653.969	3654.263	3654.514	3654.731	3654.923	3655.208	3655.453	3655.621	3655.750	3655.886	3655.983	3656.002	3655.983	3655.980	3655.952	3655.890	3655.786
	(-) Elev. N																	
	(=) d																	
	(-) 0.542																	
	(=) h																	
Girder No.4	Elev. M	3653.991	3654.277	3654.520	3654.729	3654.913	3655.187	3655.421	3655.578	3655.696	3655.821	3655.907	3655.915	3655.885	3655.874	3655.838	3655.768	3655.656
	(-) Elev. N																	
	(=) d																	
	(-) 0.542																	
	(=) h																	

NOTE—

This table contains the necessary information to determine the depth of concrete, in feet, over the girders at the points shown. All calculations can be carried in the spaces provided. Elevation "M" is the elevation of the top of slab form before any concrete has been poured. This elevation includes correction for vertical curve and deflection due to D.L. above girders.

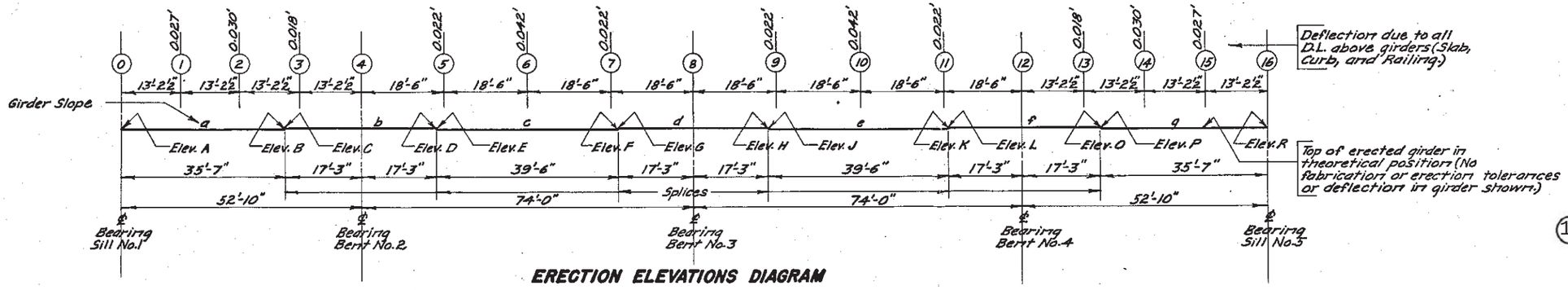
Elevation "N" is the field measured elevation taken on top of girders at the points shown. This elevation must be taken after girder erection is completed, but prior to placing any of the concrete. Girders shall not be supported by construction shoring while elevations are taken.

SUPERSTRUCTURE NOTES—

1. Structural members which are to be welded shall conform to A.S.T.M. A373 (current) steel. Steel produced under other specifications but shown to possess the physical and chemical properties of A373 (current) steel will be accepted for use where the latter is specified. Steel for pins shall conform to structural steel A.S.T.M. A235 (current) or equivalent.
2. Cost of welding shall be included in the unit price bid for Structural Steel.
3. All exposed steel surfaces shall be painted with one shop coat of red lead paint and two field coats of aluminum or other approved paint.
4. All exposed concrete edges shall be chamfered 1" unless otherwise noted.
5. Cost of canvas and red lead or preformed fabric pads shall be included in the unit price bid for Structural Steel.
6. All expansion rockers shall be positioned to set vertical at 70°F.
7. Longitudinal elements of the slab shall conform to the vertical curve.
8. Unit Stresses: Concrete - fc = 1600 p.s.i.; Re-Steel - fs = 20,000 p.s.i. (Inter. Grade).
   Design Loading: H20-S16-44 (1957) A.A.S.H.O.
9. All reinforcing steel bars shall conform to ASTM Specifications A305 (T-current) and A15 (T-Current) Intermediate Grade.
10. Cost of premolded expansion joint shall be included in the unit price bid for Class "A" Concrete.

ERECTION ELEVATIONS AND GIRDER SLOPES

Girder No.	Elevations (Top of Girder) A	B	C	D	E	F	G	H	J	K	L	O	P	R	Slopes % a	b	c	d	e	f	g
1	3653.077	3653.786	3653.807	3654.312	3654.351	3654.840	3654.861	3655.149	3655.128	3655.300	3655.321	3655.332	3655.311	3655.198	+1.9925	+1.6386	+1.2380	+0.8359	+0.4354	+0.0330	-0.3176
2	3653.290	3653.977	3653.998	3654.542	3654.522	3654.986	3655.007	3655.275	3655.254	3655.402	3655.423	3655.414	3655.393	3655.258	+1.9307	+1.5786	+1.1747	+0.7759	+0.3747	-0.0267	-0.3794
3	3653.407	3654.073	3654.093	3654.617	3654.597	3655.038	3655.059	3655.306	3655.285	3655.409	3655.430	3655.400	3655.379	3655.223	+1.8717	+1.5188	+1.1165	+0.7159	+0.3139	-0.0864	-0.4384
4	3653.429	3654.073	3654.094	3654.597	3654.577	3654.994	3655.015	3655.241	3655.221	3655.321	3655.342	3655.291	3655.271	3655.093	+1.8098	+1.4588	+1.0557	+0.6562	+0.2532	-0.1467	-0.5002



ERECTION ELEVATIONS DIAGRAM

ORIGINAL CONSTRUCTION PLANS

STR. NO. 47-061-480

FRAMING DIAGRAM AND ERECTION DATA
FOR
258'-4 1/4" CONT. COMP. GIRDER VIADUCT

30'-0" ROADWAY — 32° SKEW R.H.E.
OVER I.S. NO. 90 STA. 461+72.65 SEC. 31/6-T54N-R6E
STA. 12+54.463 TO STA. 15+12.817 — 190-1( )28
MEADE COUNTY — H20-S16-44
SOUTH DAKOTA
DEPARTMENT OF HIGHWAYS
⑩ OF ⑩ — JANUARY 1962

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
	F.M. Tr. By W.C.P.	R.K.S. N.J.	BRIDGE ENGINEER

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
	(A) (B) (C)
70 - 75	1000 1500 2640

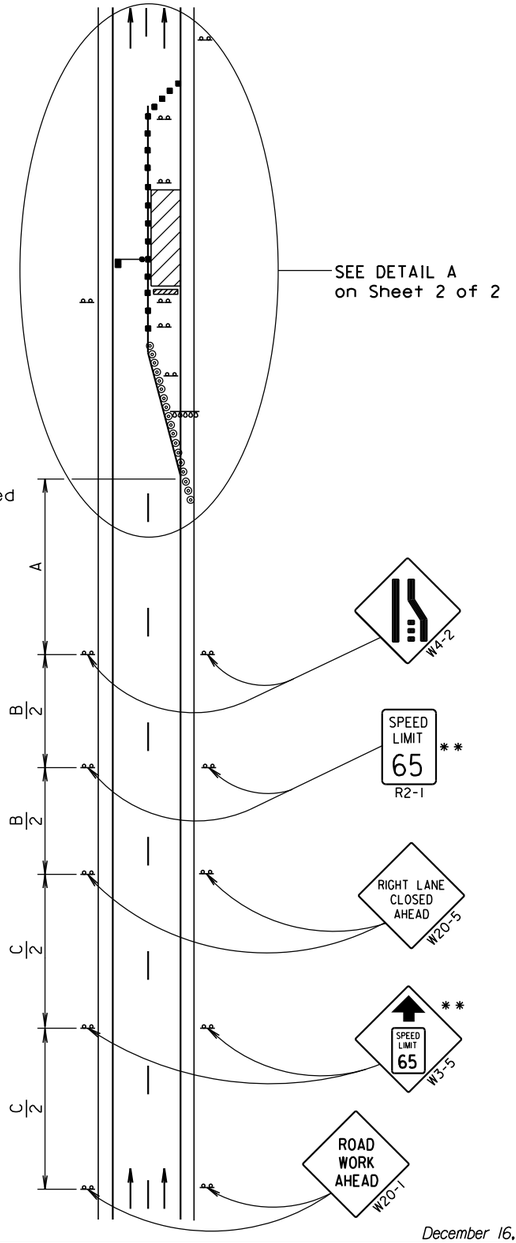
** Speed appropriate for location.

◎ 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.



December 16, 2014

Published Date: 1st Qtr. 2015	SDDOT	WORK ZONE SPEED REDUCTION FOR INTERSTATE AND HIGH SPEED MULTI-LANE HIGHWAYS	PLATE NUMBER 634.63
			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 - 50	50 *	600
55	50 *	660
60 - 65	50 *	780
70 - 75	50 *	900

* 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 shall be covered or removed when workers are not present.

■—● Flagger (As Necessary)

◎ Reflectorized Drum

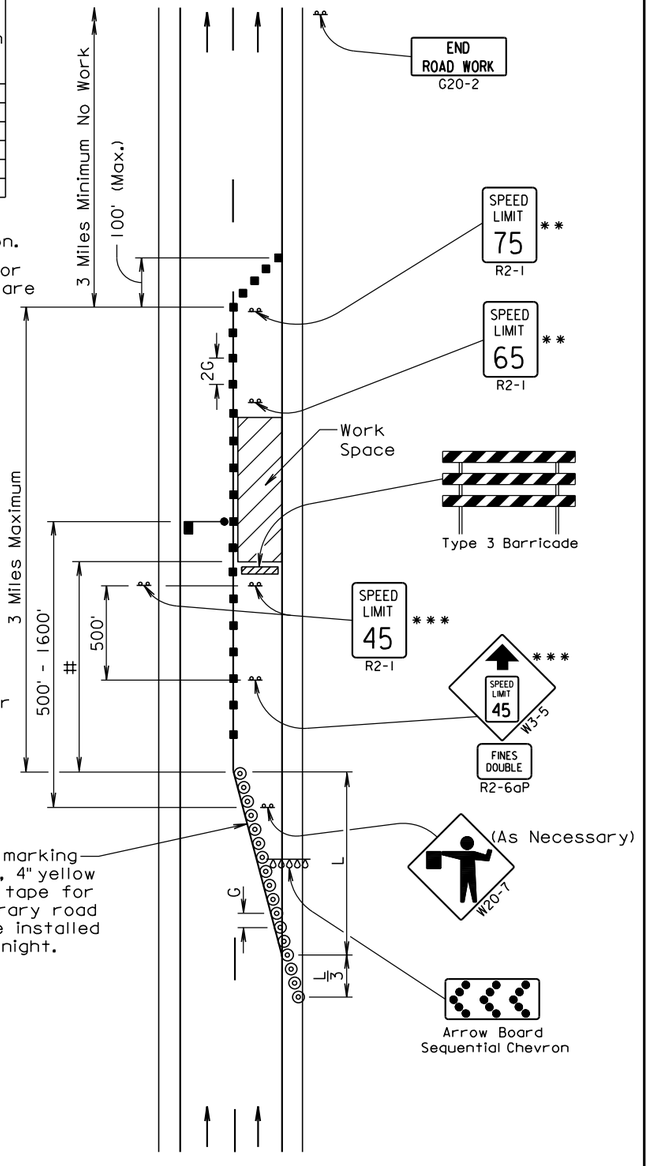
■ Channelizing Device

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

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

The channelizing devices shall 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.



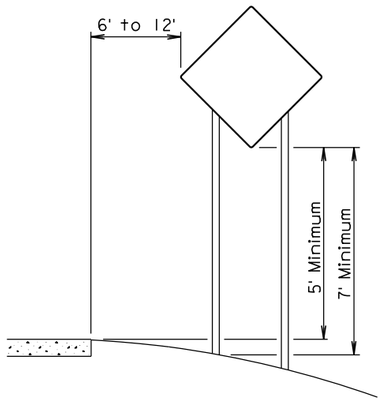
4" white temporary pavement marking tape for right lane closures, 4" yellow temporary pavement marking tape for left lane closures, or temporary road markers at 5' spacing shall be installed when the lane is closed overnight.

DETAIL A

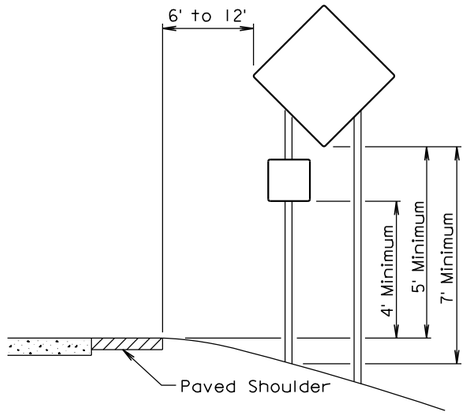
December 16, 2014

Published Date: 1st Qtr. 2015	SDDOT	WORK ZONE SPEED REDUCTION FOR INTERSTATE AND HIGH SPEED MULTI-LANE HIGHWAYS	PLATE NUMBER 634.63
			Sheet 2 of 2

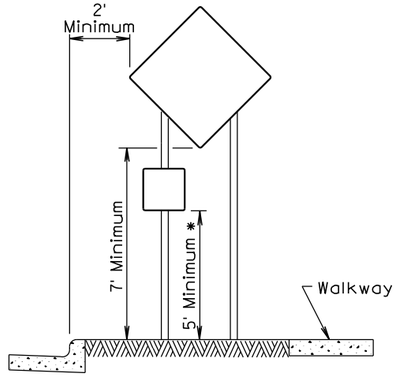
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	090E-468	15	15



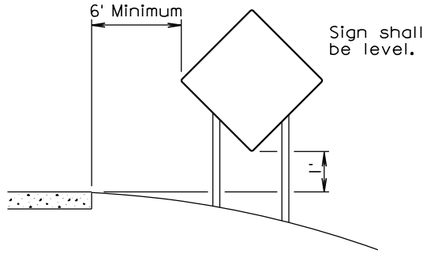
RURAL DISTRICT



RURAL DISTRICT WITH SUPPLEMENTAL PLATE



URBAN DISTRICT

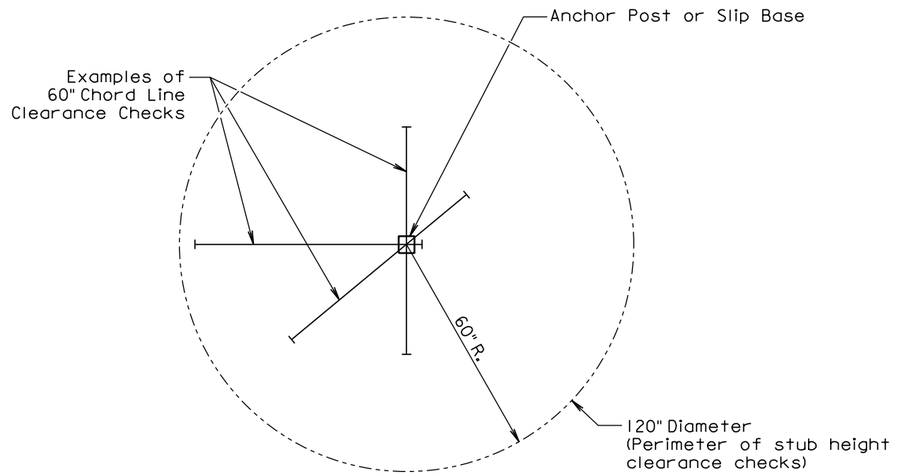


RURAL DISTRICT
3 DAY MAXIMUM
(Not applicable to regulatory signs)

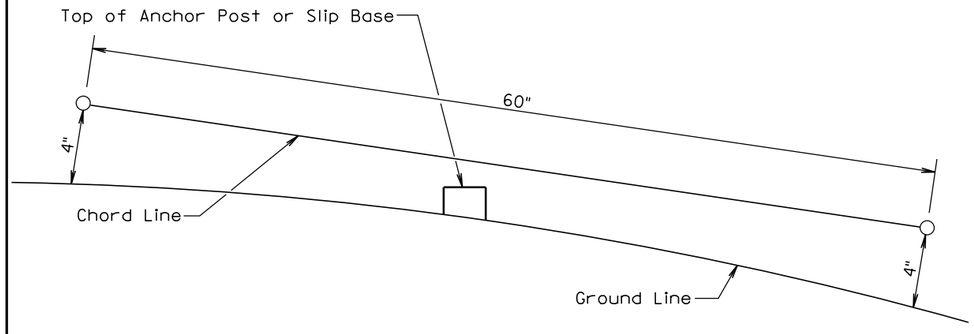
* If the bottom of supplemental plate is mounted lower than 7 feet above a pedestrian walkway, the supplemental plate should not project more than 4" into the pedestrian facility.

September 22, 2014

Published Date: 1st Qtr. 2015	SDDOT	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85
			Sheet 1 of 1



PLAN VIEW
(Examples of stub height clearance checks)



ELEVATION VIEW

GENERAL NOTES:

The top of anchor posts and slip bases SHALL 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 shall 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.

July 1, 2005

Published Date: 1st Qtr. 2015	SDDOT	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
			Sheet 1 of 1