

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION

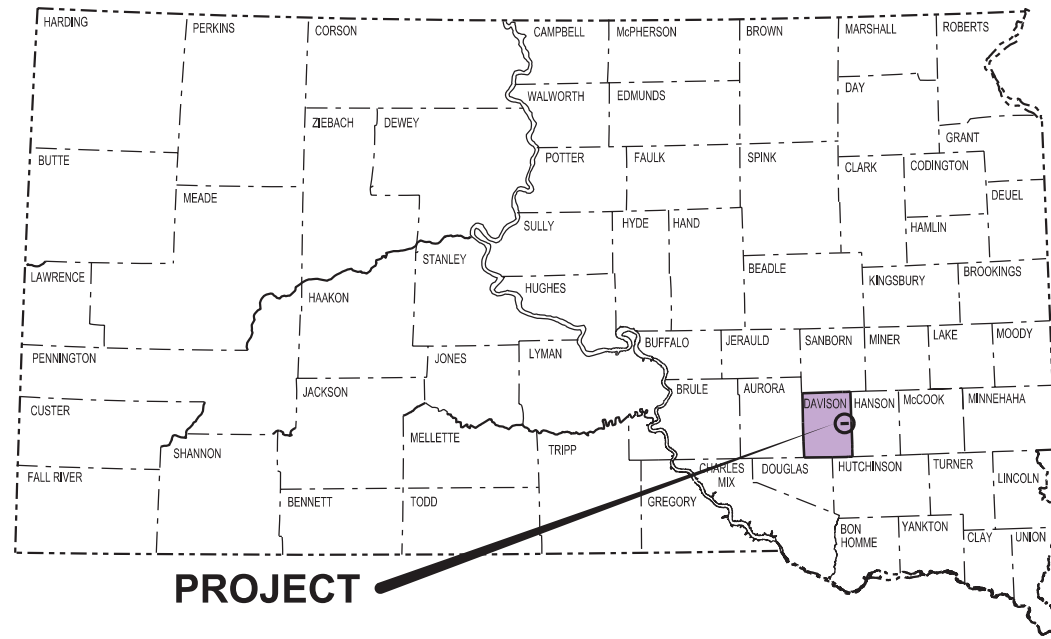
PLANS FOR PROPOSED
PROJECT 090W-288
INTERSTATE 90 WBL
DAVISON COUNTY

STRUCTURE REPAIR - HEAT STRAIGHTENING
PCN I3GU

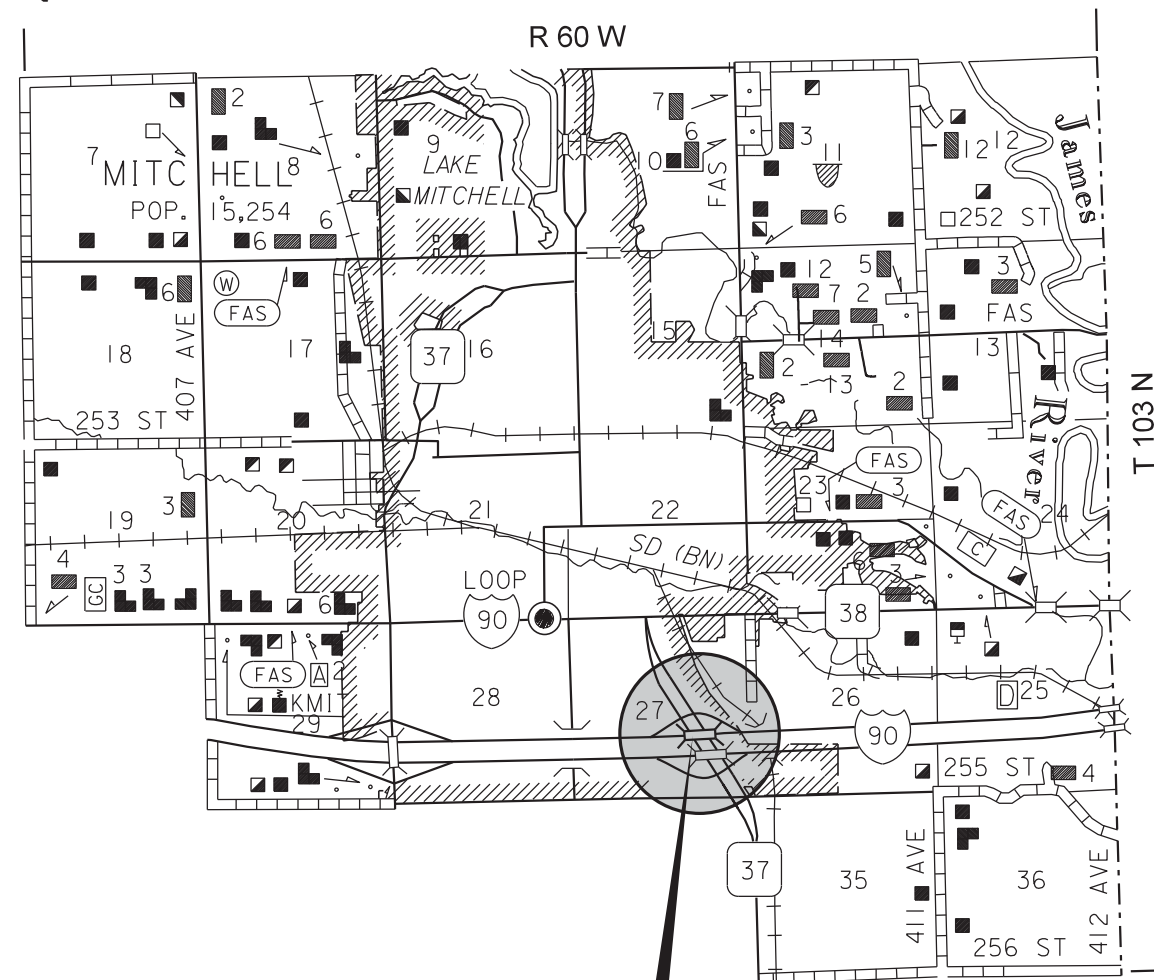
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	090 W-288	1	21

INDEX OF SHEETS

Sheet 1	Layout Maps & Index of Sheets
Sheet 2	Estimate of Quantities & Environmental Commitments
Sheets 3-5	Traffic Control
Sheets 6-21	Structure Repair Plans for Str. No. 18-157-107



PROJECT



STORM WATER PERMIT
(None required)

DESIGN DESIGNATION		
PROJECT	090W-252	SD37S
ADT(2013)	4,972	6,268
ADT(2033)	7,240	8,675
DHV	934	1076
D	51%	51%
T DHV	10.4%	7.4%
T ADT	22.9%	16.2%
V	75 MPH	35 MPH

STR. NO. 18-157-107
Cont. Comp. Girder Bridge
266'-3³/₄"=0.050 Mile
MRM 332.19 WBL

ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	090 W-288	2	21

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
410E0385	Repair Steel Diaphragm	1	Each
410E0508	Field Weld	36	In
410E0512	Grind Weld	36	In
410E0515	Drill Hole in Existing Steel	1	Each
410E0520	Surface Grinding of Structural Steel	309	SqIn
410E3010	Magnetic Particle Weld Inspection	2688	In
410E3030	Magnetic Particle Weld Inspection, Impact Damage Repair	462	SqIn
412E0100	Bridge Repainting, Class I	Lump Sum	LS
412E0500	Paint Residue Containment	Lump Sum	LS
634E0100	Traffic Control	596	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0420	Type C Advance Warning Panel	1	Each

SPECIFICATIONS

Standard Specifications for Roads and Bridges, 2004 Edition and Required Provisions, Supplemental Specifications, and 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 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 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:

- 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”.
- 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.

GENERAL MAINTENANCE OF TRAFFIC

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

Storage of vehicles and equipment shall be outside the clear zone and as near as possible to the right-of-way line. 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 to the vegetation, surfacing, embankment, delineators and existing signs resulting from such indiscriminate use shall be repaired and/or restored by the Contractor, at no expense to the State, and to the satisfaction of the Engineer.

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

TRAFFIC CONTROL DEVICES

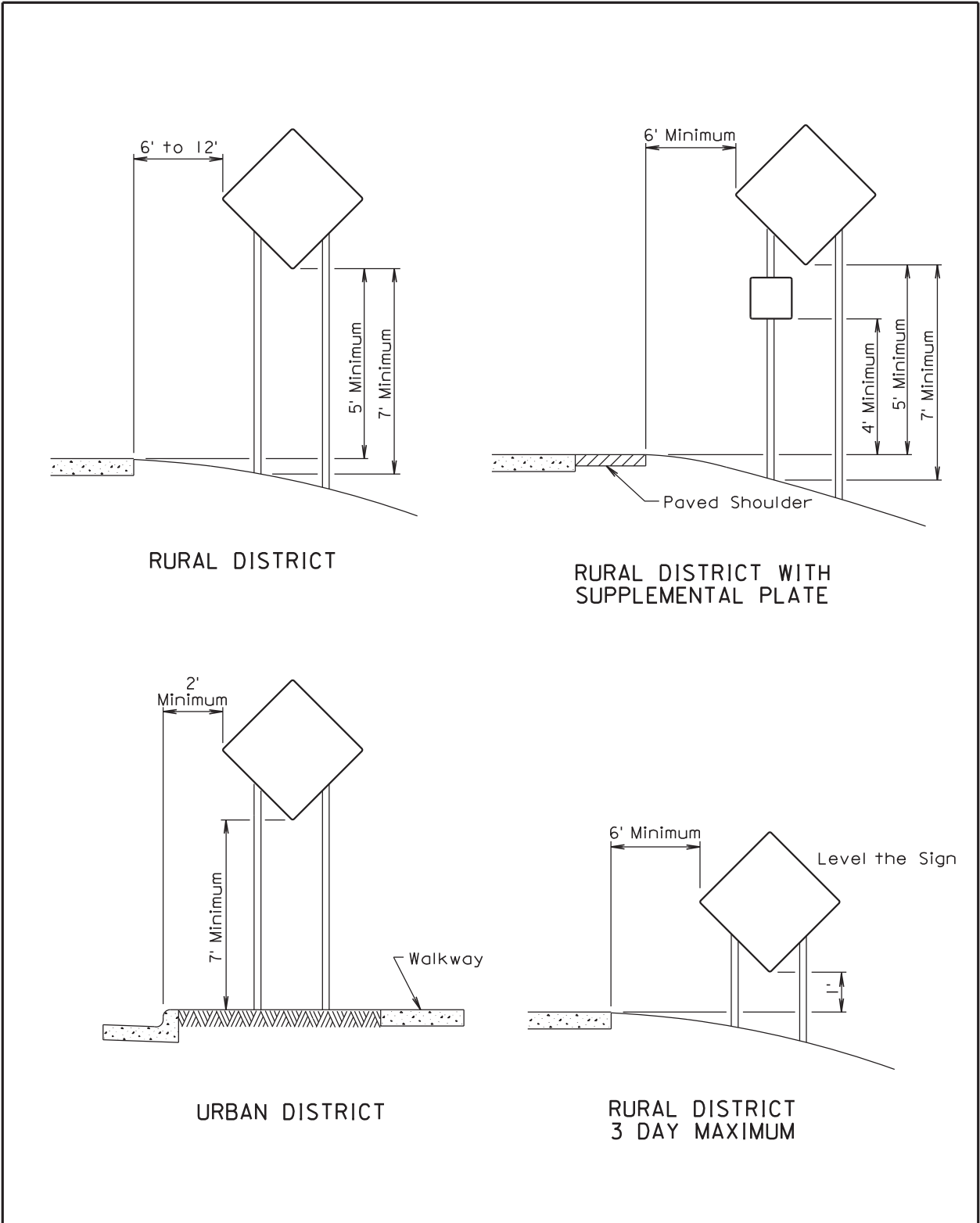
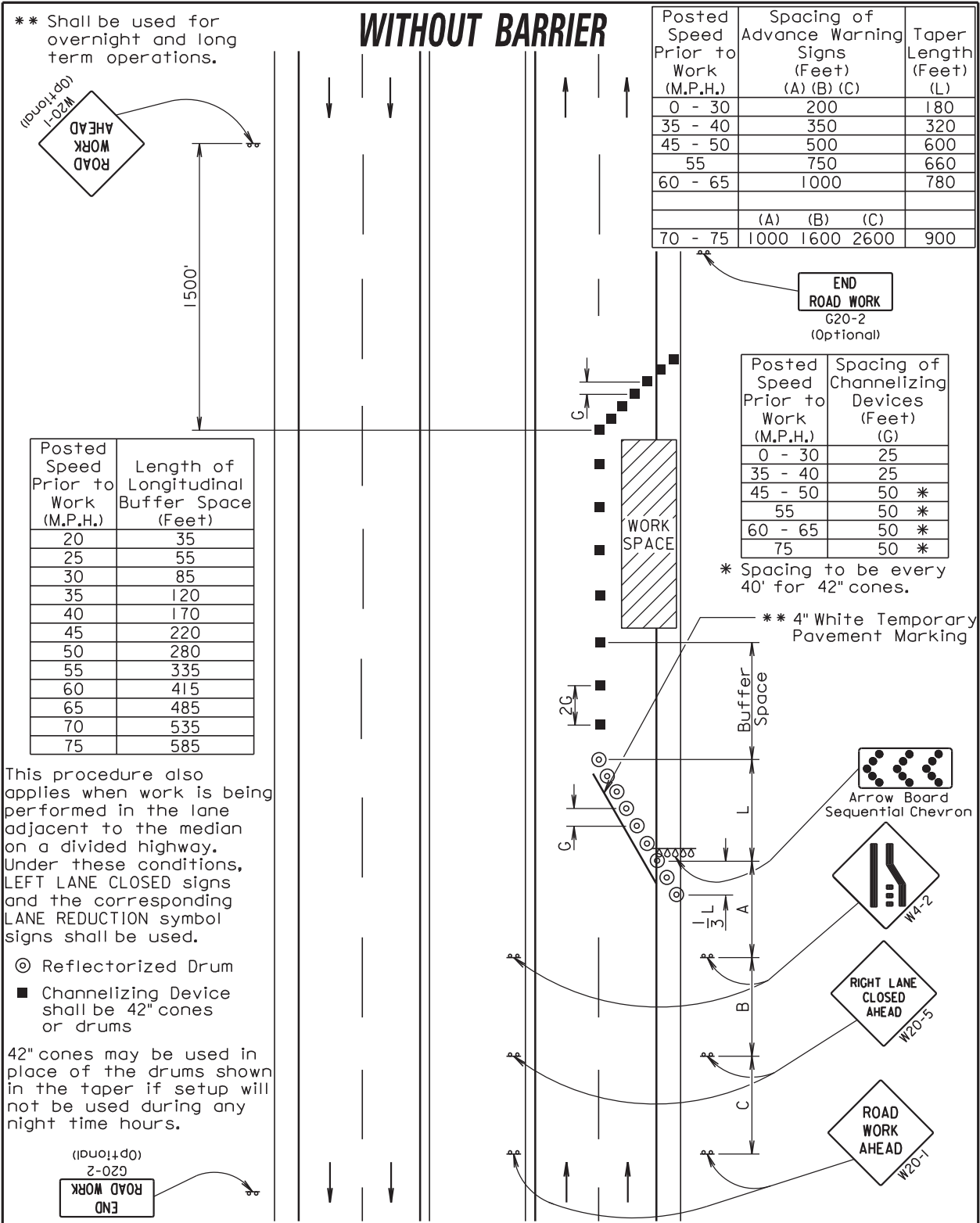
SD 37

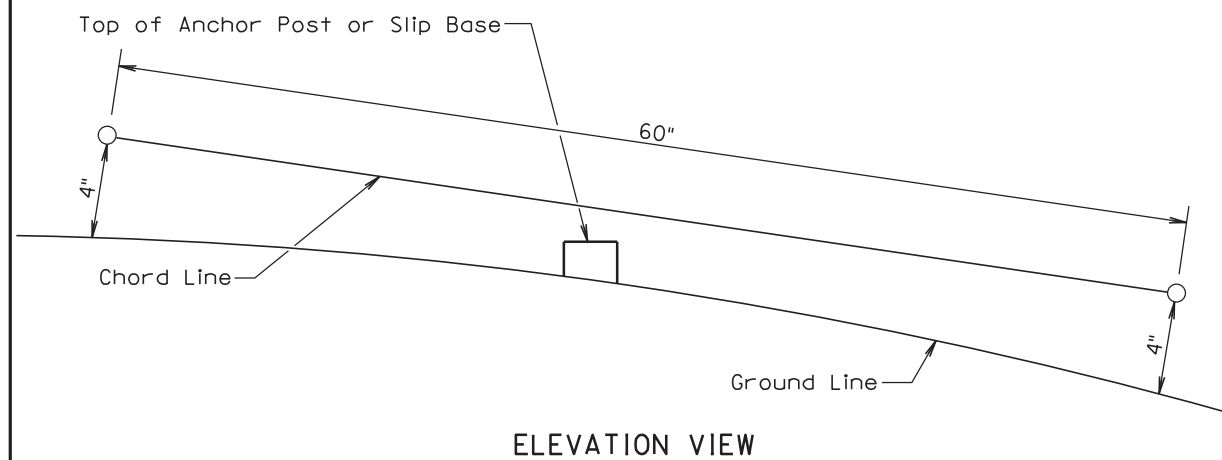
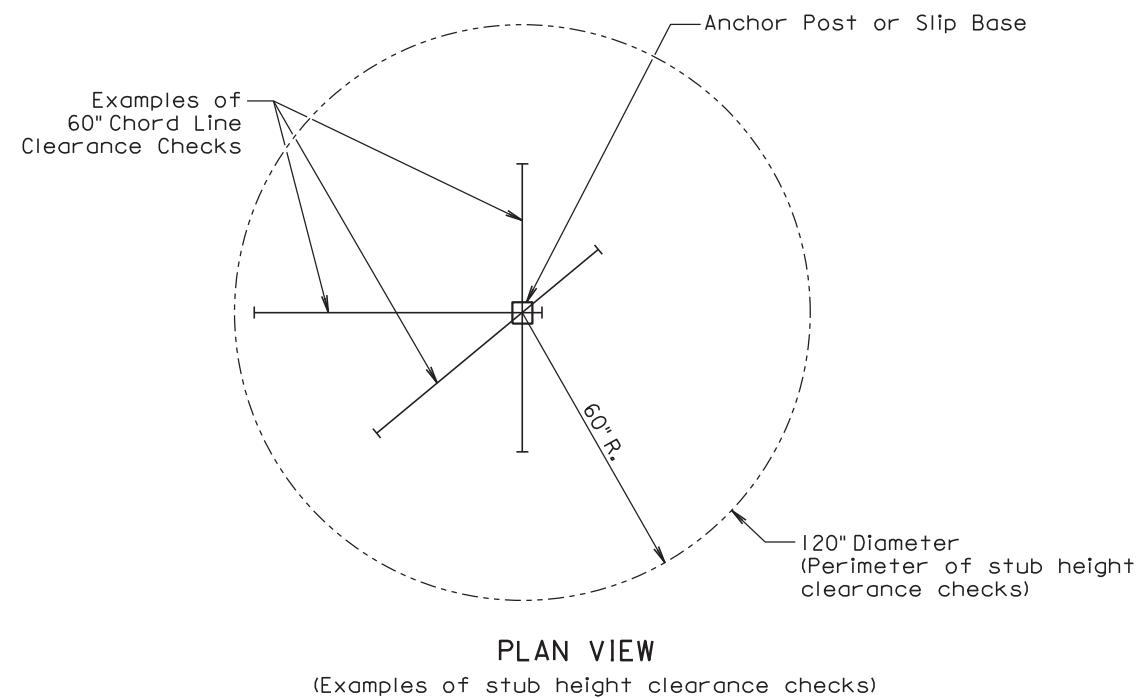
SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
G20-2	36" x 18"	END ROAD WORK	2	17	34
W4-2	48" x 48"	LEFT OR RIGHT LANE ENDS (SYMBOL)	2	34	68
W20-1	48" x 48"	ROAD WORK ##### FT. OR AHEAD	3	34	102
W20-5	48" x 48"	LT. OR RT. LANE CLOSED ##### FT. OR AHEAD	2	34	68

I 90

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
E5-1a	60" x 48"	EXIT 332 WITH 45 DEGREE ARROW (3 digits)	1	38	38
G20-2	48" x 24"	END ROAD WORK	2	24	48
W4-2	48" x 48"	LEFT OR RIGHT LANE ENDS (SYMBOL)	2	34	68
W20-1	48" x 48"	ROAD WORK ##### FT. OR AHEAD	3	34	102
W20-5	48" x 48"	LT. OR RT. LANE CLOSED ##### FT. OR AHEAD	2	34	68

Total	596
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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.

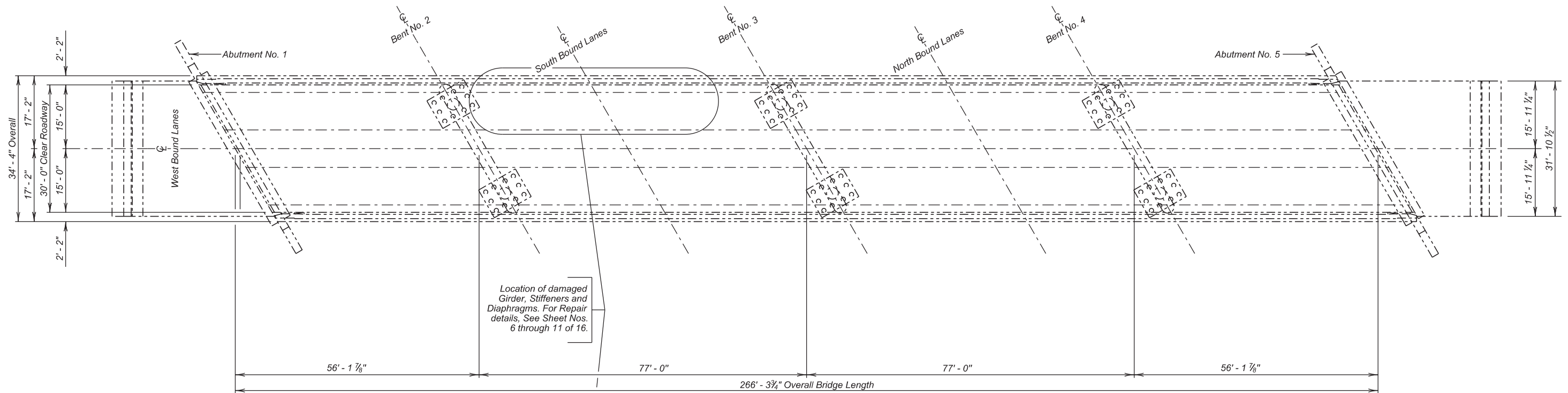
The 4" stub height clearance is not necessary for U-channel lap splices where the support is designed to yield (bend) at the base.

July 1, 2005

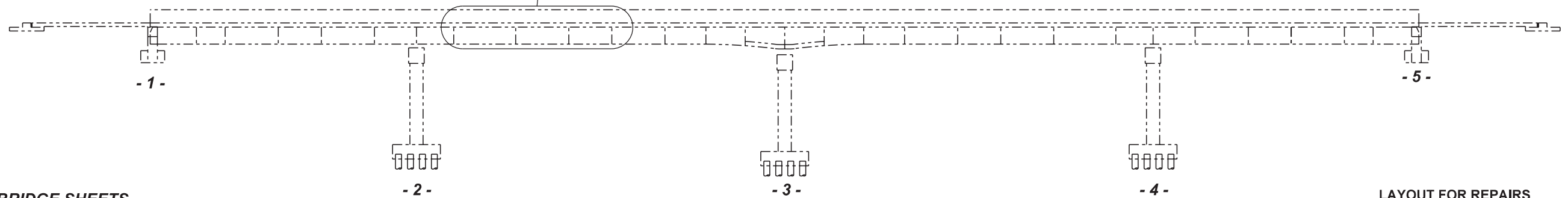
Published Date: 2nd Qtr. 2014	S D D O T	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
			Sheet 1 of 1



STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
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PLAN



ELEVATION

INDEX OF BRIDGE SHEETS -

- Sheet No. 1 - Layout for Repairs
- Sheet No. 2 - Estimate of Structure Quantities and Notes
- Sheet No. 3 - Notes (Continued)
- Sheet No. 4 - Notes (Continued)
- Sheet No. 5 - Notes (Continued)
- Sheet No. 6 - Girder No. 2 Repair
- Sheet No. 7 - Girder No. 1 Repair
- Sheet No. 8 - Girder No. 1 Repair (Continued)
- Sheet No. 9 - Girder No. 1 Diaphragm Removal
- Sheet No. 10 - Girder No. 1 Diaphragm Repair
- Sheet No. 11 - Girder No. 1 Diaphragm Repair (Continued)
- Sheet No. 12-16 - Original Construction Plans

LAYOUT FOR REPAIRS
(WEST BOUND LANES)

FOR

266' - 3 3/4" CONT. COMP. GIRDER BRIDGE

30' - 0" ROADWAY 30° SKEW RHF
OVER S.D. 37 SEC. 27-T103N-R60W
STR. NO. 18-157-107 090 W-288
PCN I3GU

DAVISON COUNTY
S. D. DEPT. OF TRANSPORTATION

JULY 2014

1 OF 16

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

DESIGNED BY KH DAVSI3GU	CK. DES. BY NP I3GURA01	DRAFTED BY KR	Kevin N. Goeden BRIDGE ENGINEER
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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
410E0385	Repair Steel Diaphragm	1	Each
410E0508	Field Weld	36	In
410E0512	Grind Weld	36	In
410E0515	Drill Hole in Existing Steel	1	Each
410E0520	Surface Grinding of Structural Steel	309	SqIn
410E3010	Magnetic Particle Weld Inspection	2688	In
410E3030	Magnetic Particle Weld Inspection, Impact Damage Repair	462	SqIn
412E0100	Bridge Repainting, Class I	Lump Sum	LS
412E0500	Paint Residue Containment	Lump Sum	LS

SPECIFICATIONS

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

SHOP PLANS

Shops plans shall be required as specified by Section 410.3.A of the Standard Specifications.

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.

- Provide traffic control per the plans.
- Nondestructively Test fillet welds, crack tips and potential crack tips at the locations shown in the plans prior to heat straightening.
- Repair crack tips and weld flaws found by Nondestructive Testing prior to heat straightening.
- Heat straighten damaged girder G1 & G2 including top & bottom flanges, web, transverse stiffeners and diaphragms.
- Repair the plan specified diaphragm.
- 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.
- Repair crack tips and weld flaws found by Nondestructive Testing after heat straightening.
- Paint all work affected areas.

FIELD WELDING PROCEDURES

- 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.
- 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.

- 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" and 1/2" girder flanges 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.
- 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.
- 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.
- 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.
- Groove joint fit-up tolerances shall be +1/16", -1/8" for root opening and +10°, -5° 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
266' - 3¾" CONT. COMP. GIRDER BRIDGE

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JULY 2014

WELD INSPECTION & NONDESTRUCTIVE TESTING (NDT)

- The Contractor shall be responsible for retaining a qualified Testing Agency to perform Visual and Magnetic Particle (MT) inspection on new welds. This Testing Agency shall be subject to approval of the Bridge Construction Engineer.
- All new welds shall be visually inspected and, in addition, certain welds shall be MT inspected as specified in the plans. Rejectable defects shall be immediately reported to the Engineer and the Contractor, and defective welds shall be marked as per the Code. The Engineer will coordinate repair procedures with the Bridge Construction Engineer. Repaired welds shall be re-inspected.
- MT inspection results shall be reported on Form N-7 of Annex L of the Bridge Welding Code. The MT inspection shall be performed by the yoke method using half-wave rectified direct or alternating current. All nondestructive testing shall be done in accordance with Section 6 of the Bridge Welding Code. Existing paint shall be removed from and steel surfaces that require NDT.
- 100% of the length of each fillet weld shall be inspected. Based on the results of the nondestructive testing, the Bridge Construction Engineer will determine the acceptability of any questionable weld defects and any proposed weld repair procedures. Any necessary repairs to the completed welds shall be accomplished in accordance with the Bridge Welding Code.
- Cracks and potential crack locations are to be MT inspected **BEFORE** heat straightening to locate the true crack tip. The following areas shall be tested:

Girder No. 1:

- Test the bottom flange to web weld on both sides of the web 3'-0" on each side of the existing affected diaphragm, location shown on Sheet No. 7 of 16 for an estimated 288 linear inches.
- Test the top flange to web weld on both sides of the web for 3'-0" on each side of the existing affected diaphragm, location shown on Sheet No. 7 of 16 for an estimated 288 linear inches.
- On the nine transverse stiffeners to be heat straightened, test the stiffener welds to web (top and bottom 12") both sides of the stiffener for an estimated 432 linear inches.
- On the localized bulge in the impact area of the flange, test an 11 foot wide by ¾ inch high area and an 11 foot wide by 1 inch deep area for an estimated 231 square inches. The 11 foot x ¾ inch area and the 11 foot wide x 1 inch deep area is an estimate and may be adjusted in the field as approved by the Bridge Construction Engineer.

Girder No. 2:

- Test the bottom flange to web weld on both sides of the web 3'-0" on each side of the existing affected diaphragm, location shown on Sheet No. 6 of 16 for an estimated 144 linear inches.
- Test the top flange to web weld on both sides of the web 3'-0" on each side of the existing affected diaphragm, location shown on Sheet No. 6 of 16 for an estimated 144 linear inches.

- On the one transverse stiffener to be heat straightened, test the stiffener welds to web (top and bottom 12") both sides of the stiffener for an estimated 48 linear inches.
- After heat straightening, secondary cracks that may develop will require MT inspection. The areas listed for each girder above shall be retested to ensure no additional cracks have developed. All new fillet welds excluding those on the diaphragm and those connecting the diaphragm to the stiffeners shall be MT tested for an additional 1344 linear inches and 231 square inches.
 - The total plans quantity for MT inspection is only an estimate. MT inspection will be measured and paid for at the contract unit price per inch for "Magnetic Particle Weld Inspection" and per square inch for "Magnetic Particle Weld Inspection, Impact Damage Repair".
 - All costs including labor, equipment and any incidentals necessary to perform the visual inspection, magnetic particle inspection and crack tip locating shall be incidental to the contract unit price per square inch for "Magnetic Particle Weld Inspection, Impact Damage Repair" and per inch for "Magnetic Particle Weld Inspection".

REPAIRS FOR NDT DETERMINED FLAWS

- Repairs options for weld defects and crack tips shall be determined by the Bridge Construction Engineer. Two repair options are:
 - Drill all crack tips in the web to 1" diameter.
 - 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.
- 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".
- 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".
- 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".
- Other repair options shall be at the discretion of the Bridge Construction Engineer.

HEAT STRAIGHTENING

This Contract includes heat straightening of steel girders including bottom flange, web, transverse stiffeners and diaphragms. 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

- Heat Straightening requires nondestructive testing of both new and existing welds. The Contractor shall use a qualified testing agency subject to approval by the Bridge Construction Engineer. The Contractor shall submit the testing agency to the Area Office for approval of the Bridge Construction Engineer. See Weld Inspection & Nondestructive Testing notes elsewhere in these plans.
- 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	8
	Rosebud	3
2	Single	8
	Rosebud	4
3	Rosebud	5
>4	Rosebud	5

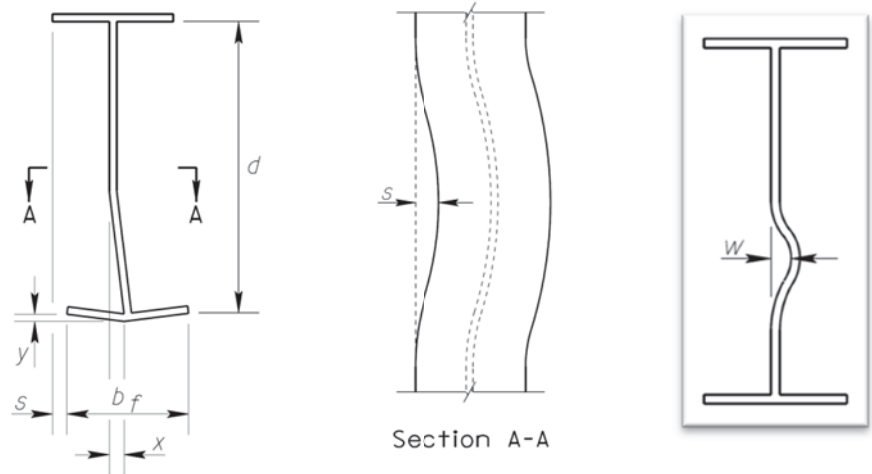
NOTES (CONTINUED)
FOR
266' - 3¾" CONT. COMP. GIRDER BRIDGE

STR. NO. 18-157-107
JULY 2014

3 OF 16

HEAT STRAIGHTENING (CONTINUED)

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 $\frac{1}{4}$ "
y = final displacement of edge of flange ≤ $\frac{1}{4}$ "
w = maximum final local deformation in web ≤ $\frac{1}{4}$ "
s = sweep of flange from original edge of flange ≤ $\frac{1}{2}$ " 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 309 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. This item may not be encountered and could be removed from the plans.

STEEL DIAPHRAGM REPAIR AND REPLACEMENT

1. A portion of the existing diaphragm shown in the plans shall be removed prior to heat straightening and nondestructive testing. Removed diaphragm portion shall not be reused and shall be disposed of by the Contractor in accordance with the waste disposal site note located elsewhere in the plans. After all heat straightening is complete, the diaphragm will be repaired.
2. The new angles, plates, and bars at the diaphragm shall conform to ASTM A709 Grade 36.
3. Cutting of the existing diaphragm shall be accomplished using the air carbon arc process. Weld removal shall be air carbon arc gouging, operated DC electrode positive.
4. Lay out all cut lines on the steel surfaces, using a marker visible during the cutting process, before any air carbon arc cutting begins.
5. Extreme care shall be exercised during the weld removal and cutting process so that absolutely no damage (such as nicks, gouges, splattering) to the surrounding metal shall occur. Any damage to the surrounding metal caused by the weld removal and/or cutting process shall be repaired by the Contractor to the satisfaction of the Engineer at no cost.
6. Grind all surfaces cut with air carbon arc process to remove high carbon deposits, provide a smooth finish, and radius all edges to accept paint.
7. All costs including equipment, material and labor to remove a portion of the steel diaphragm and to repair the steel diaphragm shall be incidental to the contract unit price per each for "Repair Steel Diaphragm".

AIR CARBON ARC CUTTING AND GOUGING

1. All cutting of diaphragm called for by these plans shall be accomplished using the air carbon arc process unless noted otherwise by the plans.
2. Before any air carbon arc cutting begins, lay out all cut lines on the steel surfaces using a marker 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 shall occur.
5. Grind all surfaces cut with the air carbon arc process to remove high carbon deposits, provide a smooth finish, and to accept paint.

INCIDENTAL WORK (STRUCTURE)

The following shall all be considered "Incidental Work, Structure":

1. Solvent cleaning of the girders prior to any other work being done on the structure. This will be done to remove the hydraulic oil that remains on the girders as a result of the accident. The approximate area to be cleaned is 343 Square Feet.
2. 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.
3. All materials, labor, and equipment necessary to perform all 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.

NOTES (CONTINUED)

FOR
266' - 3 $\frac{3}{4}$ " CONT. COMP. GIRDER BRIDGE

STR. NO. 18-157-107

JULY 2014

4 OF 16

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	090 W-288	10	21

PAINT RESIDUE REMOVAL AND CONTAINMENT (CONTINUED)

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.
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 Mitchell 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 surface for a distance of 6 inches outside of the outer edges of the heat straightening. 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 583 square feet. This informational quantity assumes the area between Bent No. 2 to the bolted splice near Bent No. 3 on girder 1 and the work affected areas of the diaphragm stiffener on girder 2. 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. Contain and collect all of the existing paint residue and/or abrasive blasting media according to Section 412 of the Construction Specifications.
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 for the Department for color approval.

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

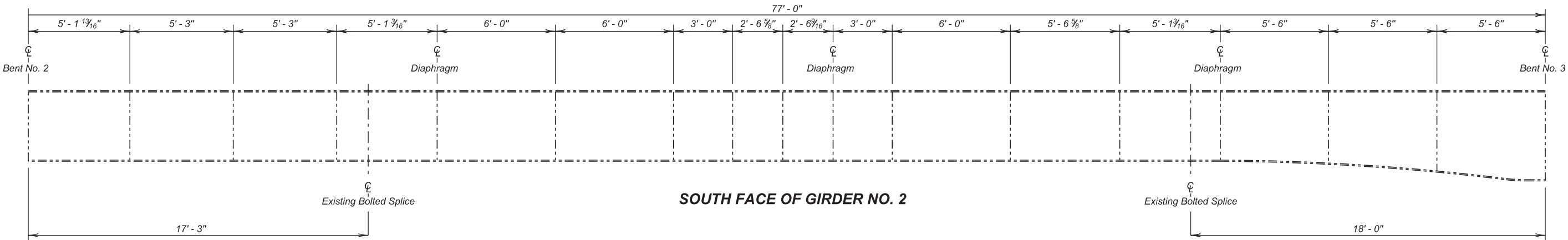
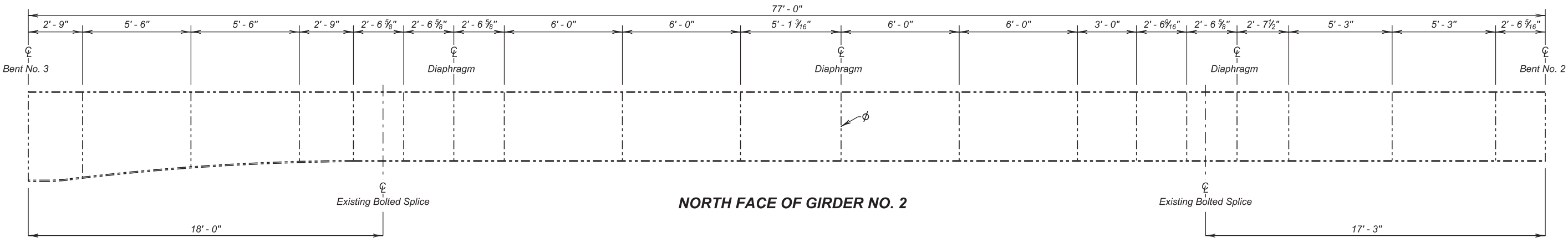
NOTES (CONTINUED)
FOR
266' - 3³/₄" CONT. COMP. GIRDER BRIDGE

STR. NO. 18-157-107
JULY 2014

5 OF 16

DESIGNED BY KH DAVSI3GU	CK. DES. BY NP I3GURA05	DRAFTED BY KH	<i>Kevin N. Goeden</i> BRIDGE ENGINEER
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STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	090 W-288	11	21



phi Heat Straighten Stiffener

NOTES:

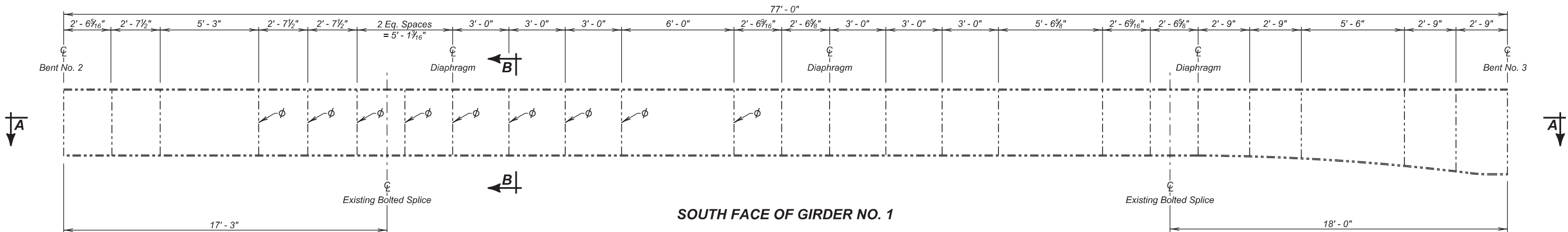
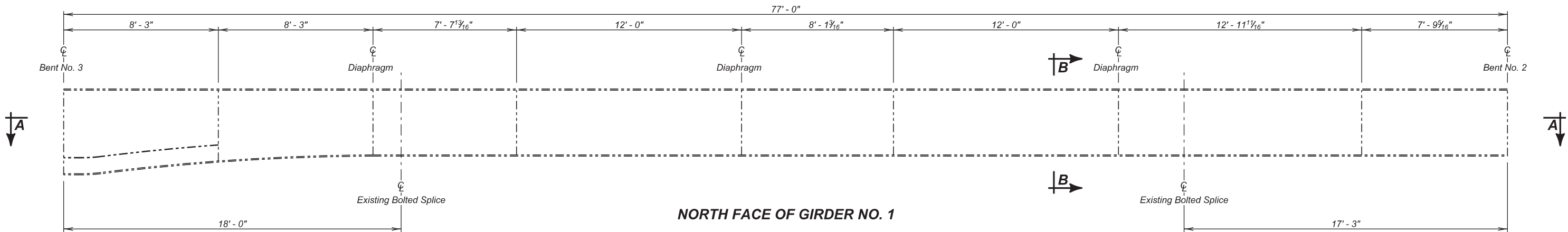
Girder web, bottom flange, and diaphragms shall be heat straightened as necessary.
Concrete deck not shown for clarity.

GIRDER NO. 2 REPAIR
FOR
266' - 3 3/4" CONT. COMP. GIRDER BRIDGE
30' - 0" ROADWAY 30° SKEW RHF
OVER SD 37 SEC. 27-T103N-R60W
STR. NO. 18-157-107 090 W-288

DAVISON COUNTY
S. D. DEPT. OF TRANSPORTATION
JULY 2014

DESIGNED BY KH LAWR0223	CK. DES. BY NP 0223KA05	DRAFTED BY KR	<i>Kevin N. Goeden</i> BRIDGE ENGINEER
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STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	090 W-288	12	21



∅ Heat Straighten Stiffener

NOTES:

This sheet is to be used in conjunction with Sheet No. 8 thru 11 of 16.

All stiffeners and diaphragms that are not to be removed and replaced, shall be heat straightened as necessary. Girder web, bottom flange, and diaphragms shall be heat straightened as necessary.

Concrete deck not shown for clarity.

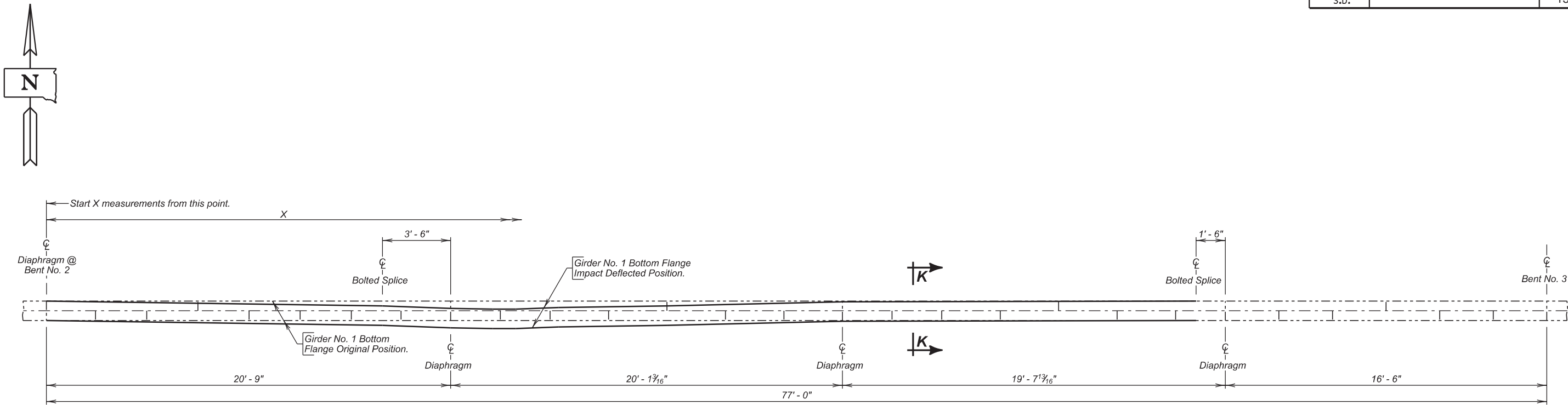
Section A - A is located on Sheet No. 8 of 16.

Section B - B is located on Sheet Nos. 9 & 10 of 16.

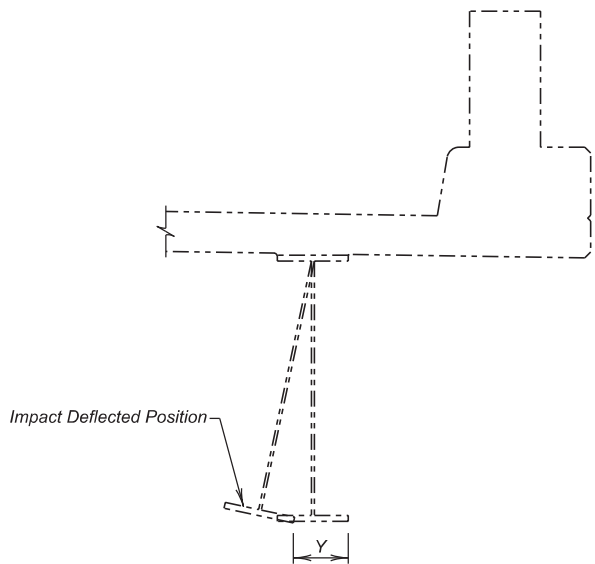
GIRDER NO. 1 REPAIR
FOR
266' - 3³/₄" CONT. COMP. GIRDER BRIDGE
30' - 0" ROADWAY 30° SKEW RHF
OVER SD 37 SEC. 27-T103N-R60W
STR. NO. 18-157-107 090 W-288

DAVISON COUNTY
S. D. DEPT. OF TRANSPORTATION
JULY 2014

DESIGNED BY KH LAWR0223	CK. DES. BY NP 0223KA06	DRAFTED BY KR	<i>Kevin N. Goeden</i> BRIDGE ENGINEER
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SECTION A - A
Girder No. 1 - Bottom Flange



SECTION K - K
(Shown at X measurements)

GIRDER NO. 1 IMPACT DEFLECTED POSITION MEASUREMENTS	
X ±	Y ±
0'	0"
17.25'	3"
20.75'	4½"
24.75'	5"
28.75'	4"
31.85'	3"
40.85'	½"
59'	0"

NOTES:

Heat Straighten Girder No. 1 top flange, bottom flange, web, stiffeners and diaphragms. See Notes.

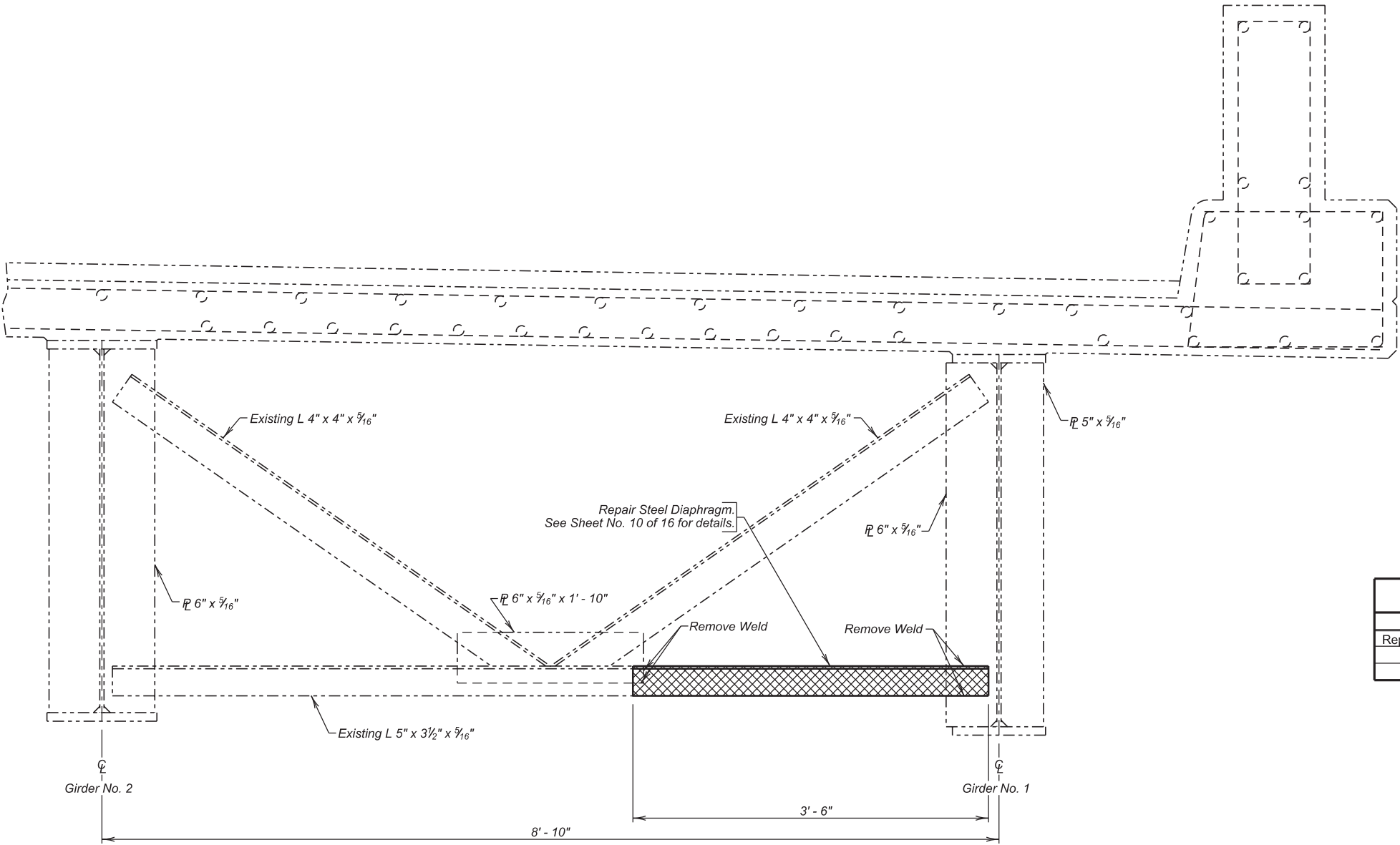
This Sheet to be used in conjunction with Sheets No. 7 of 16.

✕ For X > 59', Y = 0.

GIRDER NO. 1 REPAIR (CONTINUED)
FOR
266' - 3¾" CONT. COMP. GIRDER BRIDGE
30' - 0" ROADWAY 30° SKEW RHF
OVER SD 37 SEC. 27-T103N-R60W
STR. NO. 18-157-107 090 W-288

DAVISON COUNTY
S. D. DEPT. OF TRANSPORTATION
JULY 2014

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	090 W-288	14	21



SECTION B - B

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Repair Steel Diaphragm	Each	1

NOTE :
This sheet is to be used in conjunction
with Sheet Nos. 7, 10 & 11 of 16.

GIRDER NO. 1 DIAPHRAGM REMOVAL
FOR
266' - 3 $\frac{3}{4}$ " CONT. COMP. GIRDER BRIDGE
30' - 0" ROADWAY 30° SKEW RHF
OVER SD 37 SEC. 27-T103N-R60W
STR. NO. 18-157-107 090 W-288

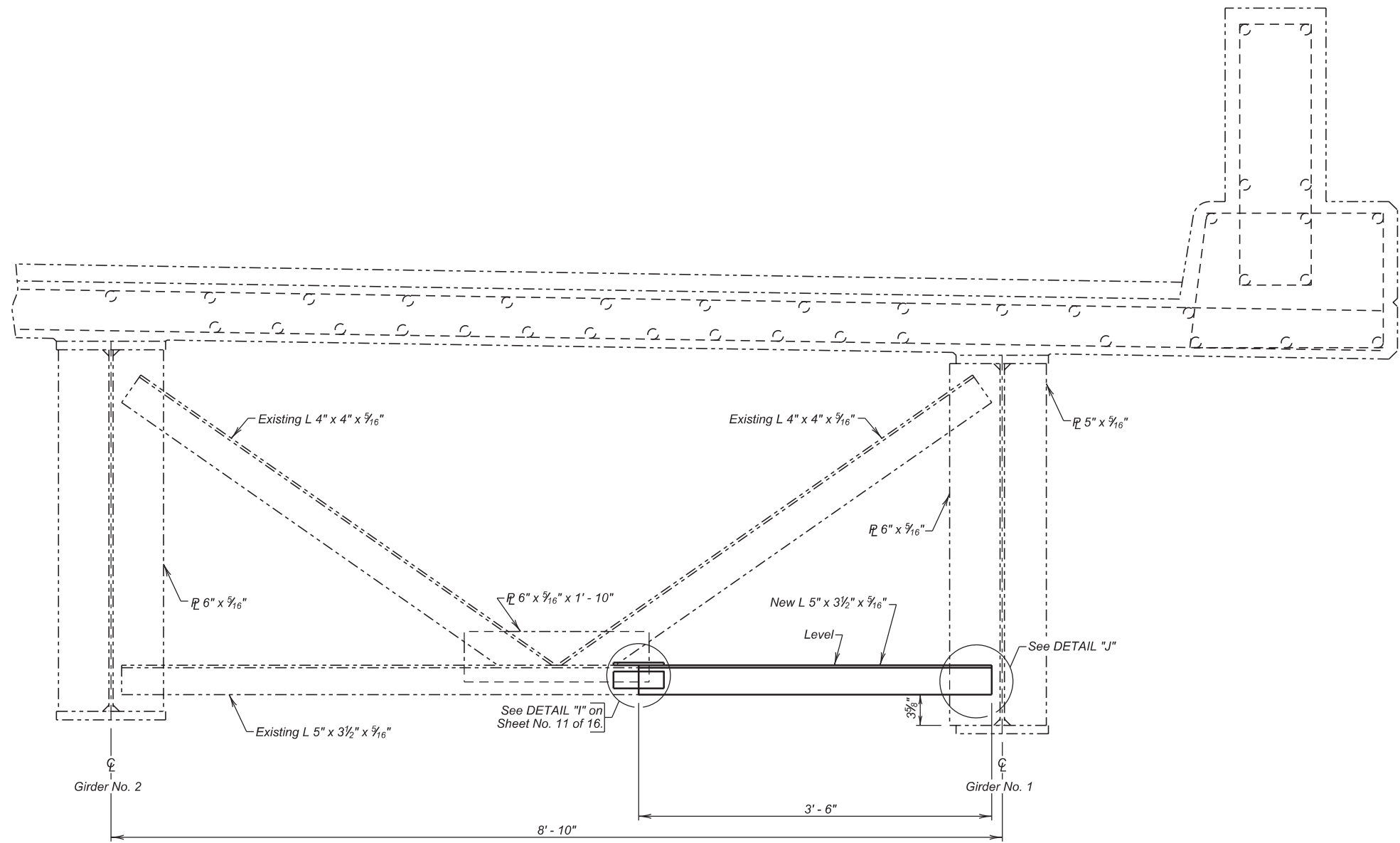
DAVISON COUNTY
S. D. DEPT. OF TRANSPORTATION

JULY 2014

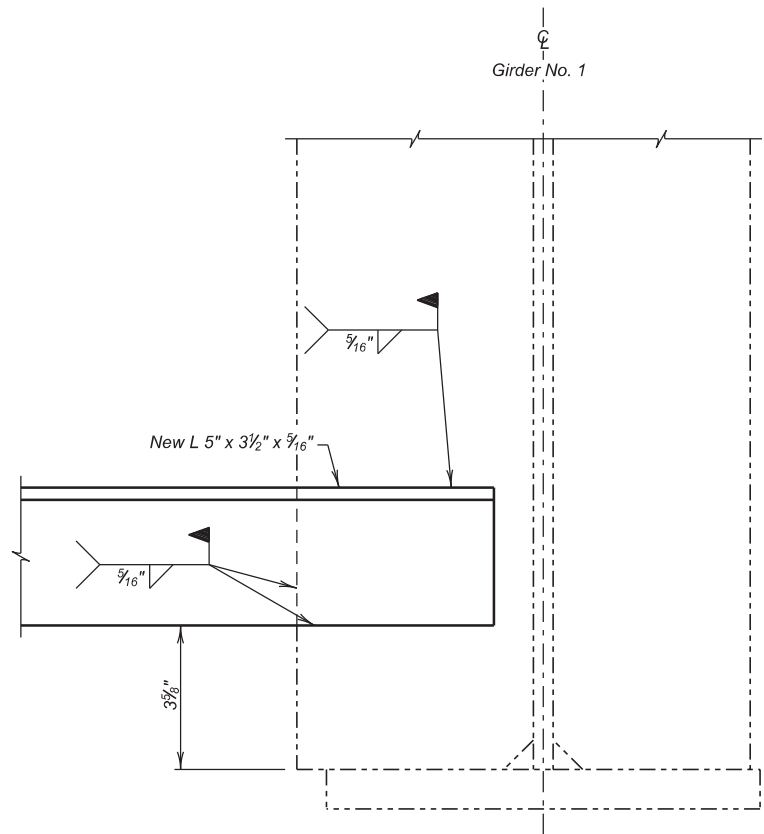
9 OF 16

DESIGNED BY KH LAWR0223	CK. DES. BY NP 0223KA08	DRAFTED BY KR	<i>Kevin N. Goeden</i> BRIDGE ENGINEER
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STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	090 W-288	15	21



SECTION B - B
(New Diaphragm)



DETAIL "J"

NOTE :
This sheet is to be used in conjunction
with Sheet Nos. 7, 9 & 11 of 16.

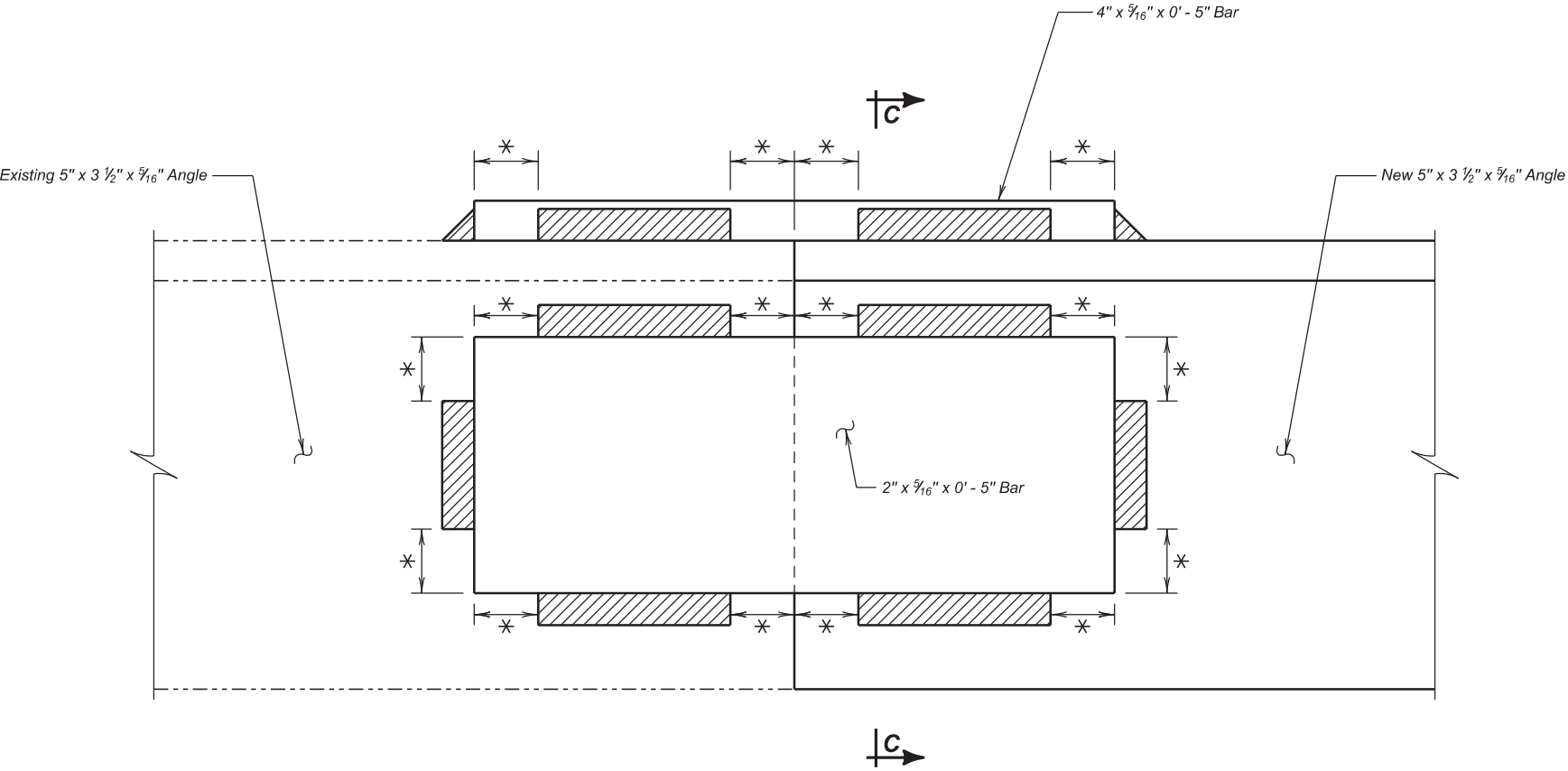
GIRDER NO. 1 DIAPHRAGM REPAIR
FOR
266' - 3 3/4" CONT. COMP. GIRDER BRIDGE
30' - 0" ROADWAY 30° SKEW RHF
OVER SD 37 SEC. 27-T103N-R60W
STR. NO. 18-157-107 090 W-288

DAVISON COUNTY
S. D. DEPT. OF TRANSPORTATION
JULY 2014


10 OF 16

DESIGNED BY KH LAWR0223	CK. DES. BY NP 0223KA09	DRAFTED BY KR	<i>Kevin N. Goeden</i> BRIDGE ENGINEER
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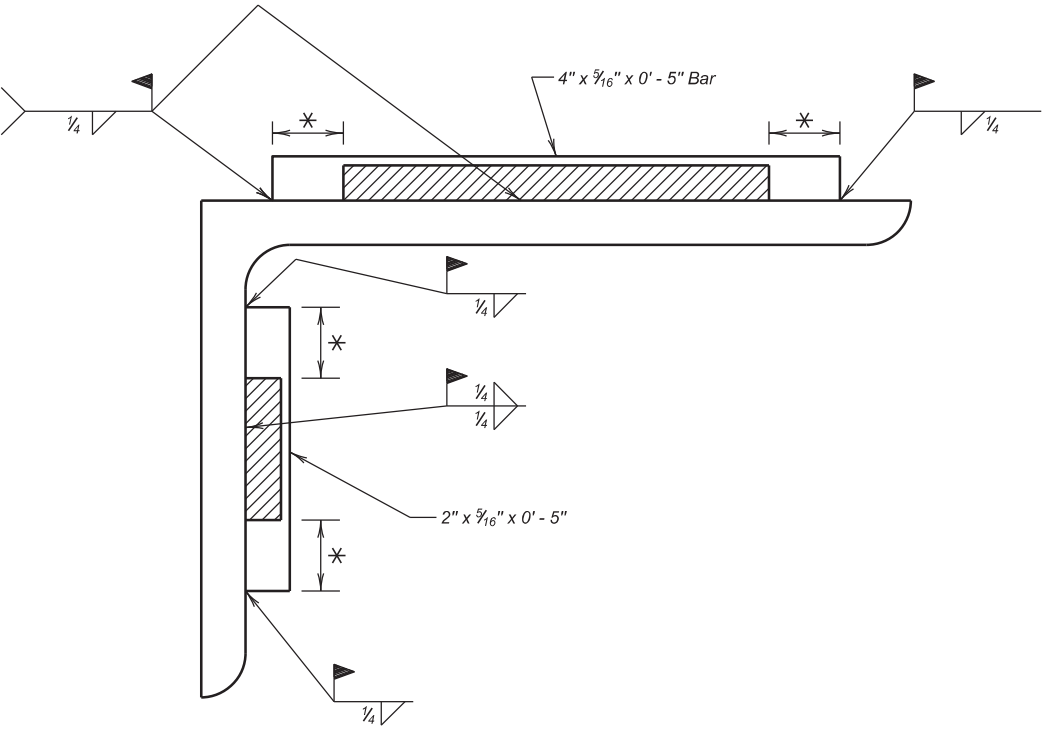
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	090 W-288	16	21



DETAIL "I"
(Elevation View)

 1/4" Fillet Weld (Typ.)

* 1/2" No Weld (Typ.)



SECTION C - C

NOTE :
This sheet is to be used in conjunction
with Sheet No. 9 & 10 of 16.

GIRDER NO. 1 DIAPHRAGM REPAIR (CONTINUED)
FOR
266' - 3 3/4" CONT. COMP. GIRDER BRIDGE
30' - 0" ROADWAY 30° SKEW RHF
OVER SD 37 SEC. 27-T103N-R60W
STR. NO. 18-157-107 090 W-288

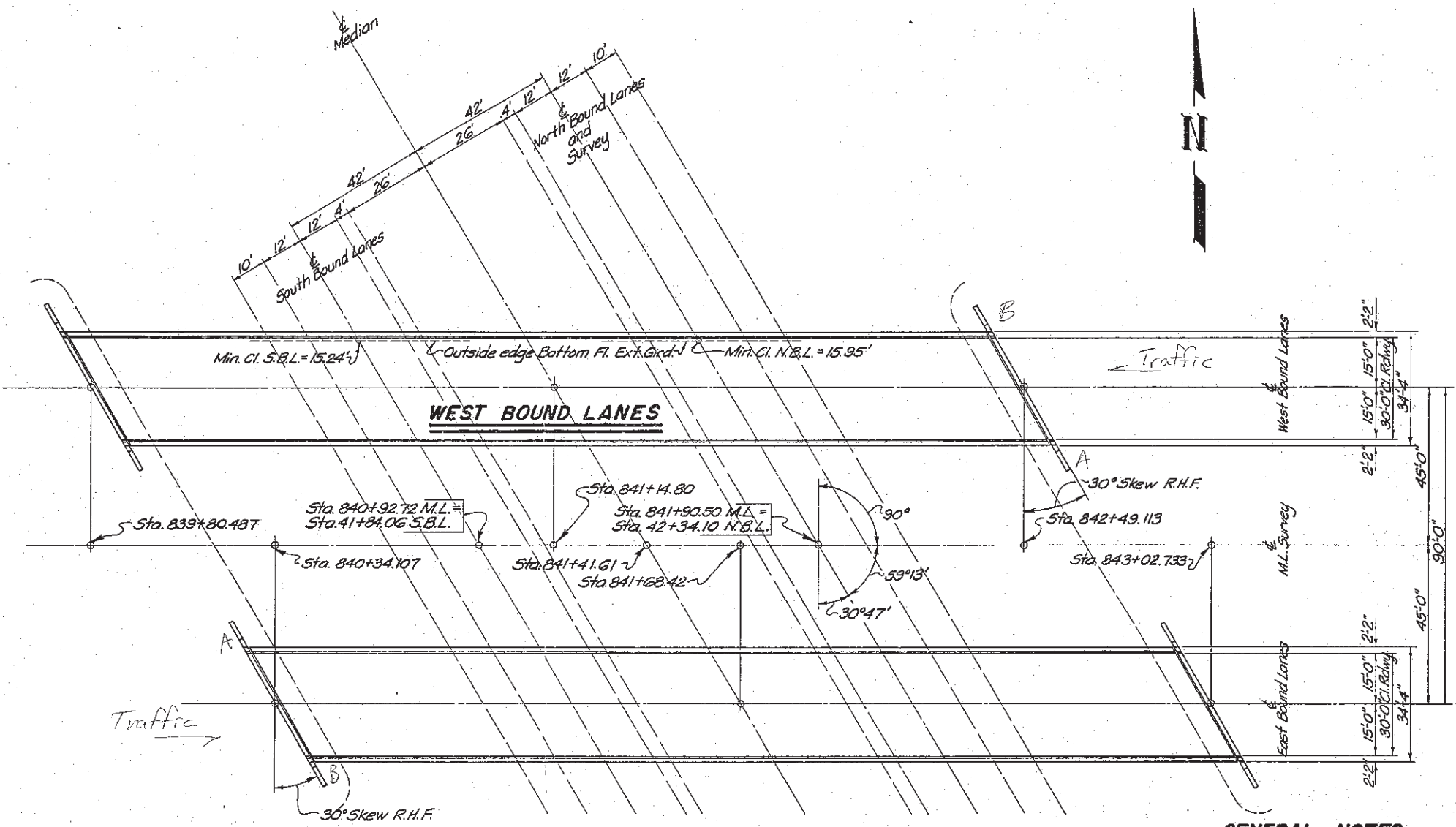
DAVISON COUNTY
S. D. DEPT. OF TRANSPORTATION
JULY 2014

DESIGNED BY KH LAWR0223	CK. DES. BY NP 0223KA10	DRAFTED BY KR	 BRIDGE ENGINEER
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INDEX OF BRIDGE SHEETS—

- Sheet No. 1 - Layout and Quantities
- Sheet No. 2 - General Drawing
- Sheet No. 3 - Subsurface Investigations
- Sheet No. 4 - Sill Details
- Sheet No. 5 - Bent Details
- Sheet No. 6 - Superstructure Details
- Sheet No. 7 - Superstructure Details
- Sheet No. 8 - Details of Expansion Device and Shoes
- Sheet No. 9 - Framing Diagram and Erection Data
- Sheet No. 10 - Type RT-1 Steel Railing Details
- Sheet No. 11 - Field Splice Details

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	090 W-288	17	21



SPECIFICATION NOTE —

Use South Dakota Standard Specifications for Roads and Bridges 1963 Edition, approved as Standard September 21, 1964, and Required Provisions, Supplemental Specifications and/or Special Provisions as included in the proposal.

LAYOUT

GENERAL NOTES—

- 1. See NOTES on Sheet No. 1 thru No. 11.
- 2. Rail posts shall be built vertical.
- 3. The contractor shall have sufficient pile splice material on hand before pile driving is started. See standard plate No. 303 for pile splice details.
- 4. Bridge Contractor shall furnish and install 1 1/2" x 7 1/2" sleeve nut unit in wing walls as shown on standard Plate No. 304.
- 5. In the event pile shoes are used, see standard Plate No. 301 for details.

ORIGINAL CONSTRUCTION PLANS

(WEST BOUND LANES)
LAYOUT AND QUANTITIES
FOR

266'-3 3/4"

CONT. COMP GIRDER VIADUCT

30'-0" ROADWAY 30° SKEW R.H.F.
OVER S.D. NO. 37 STA. 841+41.61 M.L. SEC. 27-T103N-R60W
STA. 839+80.487 TO 842+49.113 190-7(16)328
STR. NO. 18-157-107 DAVISON COUNTY

SOUTH DAKOTA HS 20-44
DEPARTMENT OF HIGHWAYS (& ALT)
JULY 1964 12 OF 16

ITEM	ESTIMATED QUANTITIES		Type RT-1 Steel Rolling-Lyn. Fk	Timber Piles-Lin. Ft.	Excavation-Cu Yds.	Slope Protect
	Class A Conc. Cu Yds.	Steel-Lbs. Reinf. Struct.				
Superstructure	290.5	66,185	138,575	536.9		245.22
Sill No. 1	30.2	325,100		118' 14" = 154' 10" 20'	28	260
Bent No. 2	378	8440		198' 12" = 278' 10" 16'	116	
Bent No. 3	378	8440		198' 12" = 278' 10" 16'	52	
Bent No. 4	378	8440		198' 12" = 278' 10" 16'	63	246.42
Sill No. 5	30.2	325,100		118' 16" = 176' 10" 20'	28	260
TOTALS	1364.5	1,779,933	138,575	1,190.4	250	943

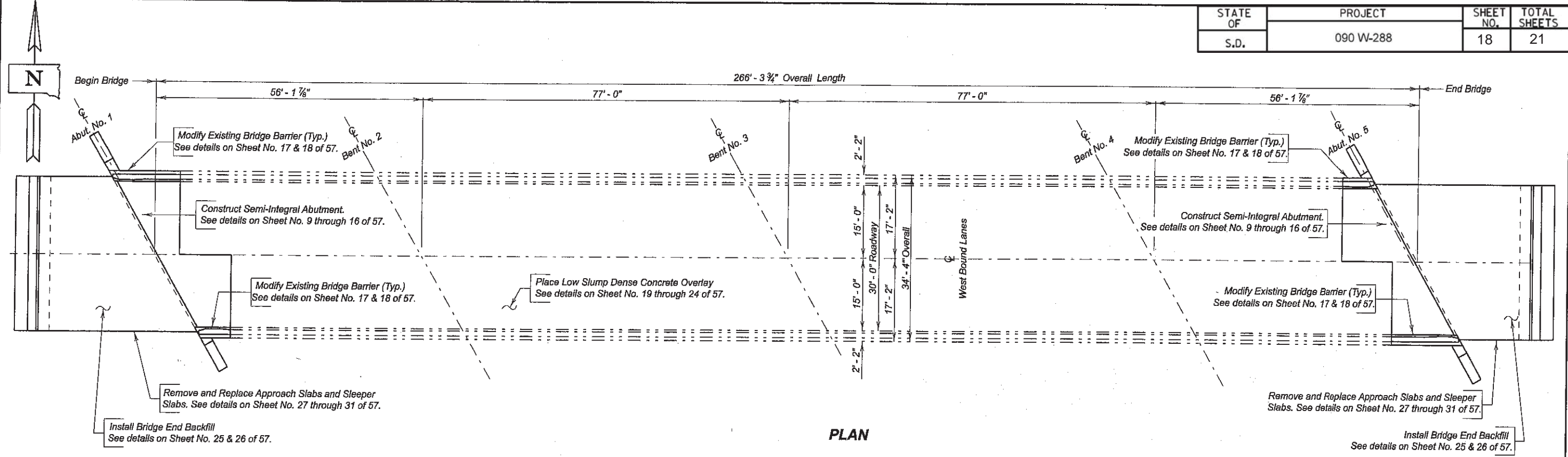
One Treated Timber Test Pile shall be driven at Sills No. 1 and No. 5 and at Bents No. 2, 3, and 4 before remaining piles are ordered.
Unclassified Excavation to be done by others.
See Grading Plans for Slope Protection.

491.64

F.F. 11-16-66 R.O.U.

Item	Str. Exc.	Tim. Piling	Tim. Culvert	Test Piling	Test Culvert
Aut. 1	22.33	15.6	13.4	13.4	26.6
B. 2	24.44	279.2	9.8	15.3	2.0
B. 3	52.08	282.2	9.4	16.2	1.8
B. 4	54.16	183.1	10.7	8.4	6.6
Aut. 5	22.75	13.1	37.8	15.4	4.4
Total	216.82	859.4	76.3	74.5	38.8

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
	R.C.M.F.F.P.M.	M.B.S.	<i>[Signature]</i>



PLAN

INDEX OF BRIDGE SHEETS-

- | | |
|---|---|
| Sheet No. 1 - Layout for Upgrading | Sheet No. 21 - Deck Profiles for Low Slump Dense Concrete Overlay (Cont.) |
| Sheet No. 2 - Estimated Quantities and notes | Sheet No. 22 - Deck Profiles for Low Slump Dense Concrete Overlay (Cont.) |
| Sheet No. 3 - Notes (Cont.) | Sheet No. 23 - As-Built Elevation Survey |
| Sheet No. 4 - Notes (Cont.) | Sheet No. 24 - As-Built Elevation Survey (Cont.) |
| Sheet No. 5 - Notes (Cont.) | Sheet No. 25 - Bridge End Backfill and Underdrain |
| Sheet No. 6 - Notes (Cont.) | Sheet No. 26 - Bridge End Backfill and Underdrain (Cont.) |
| Sheet No. 7 - Notes (Cont.) | Sheet No. 27 - Layout for Approach Slabs |
| Sheet No. 8 - Concrete Breakout | Sheet No. 28 - Approach Slab Details |
| Sheet No. 9 - Girder Modification Details | Sheet No. 29 - Approach Slab Details (Cont.) |
| Sheet No. 10 - Abutment Replacement Layout | Sheet No. 30 - Approach Slab Details (Cont.) |
| Sheet No. 11 - Abutment Replacement Details | Sheet No. 31 - Approach Slab Joint Detail |
| Sheet No. 12 - Abutment Replacement Details | Sheet No. 32 - Standard Plate Nos. 460.03 & 630.92 |
| Sheet No. 13 - Abutment Replacement Details | Sheet No. 33 - Standard Plate No. 460.05 & 680.03 |
| Sheet No. 14 - Seat Modification Details | Sheet No. 34 through 57 - Original Construction Plans |
| Sheet No. 15 - Deck Reconstruction Details | |
| Sheet No. 16 - Deck Reconstruction Details (Cont.) | |
| Sheet No. 17 - End Block Modification Details | |
| Sheet No. 18 - End Block Modification Details (Cont.) | |
| Sheet No. 19 - Deck Profiles for Low Slump Dense Concrete Overlay | |
| Sheet No. 20 - Deck Profiles for Low Slump Dense Concrete Overlay (Cont.) | |

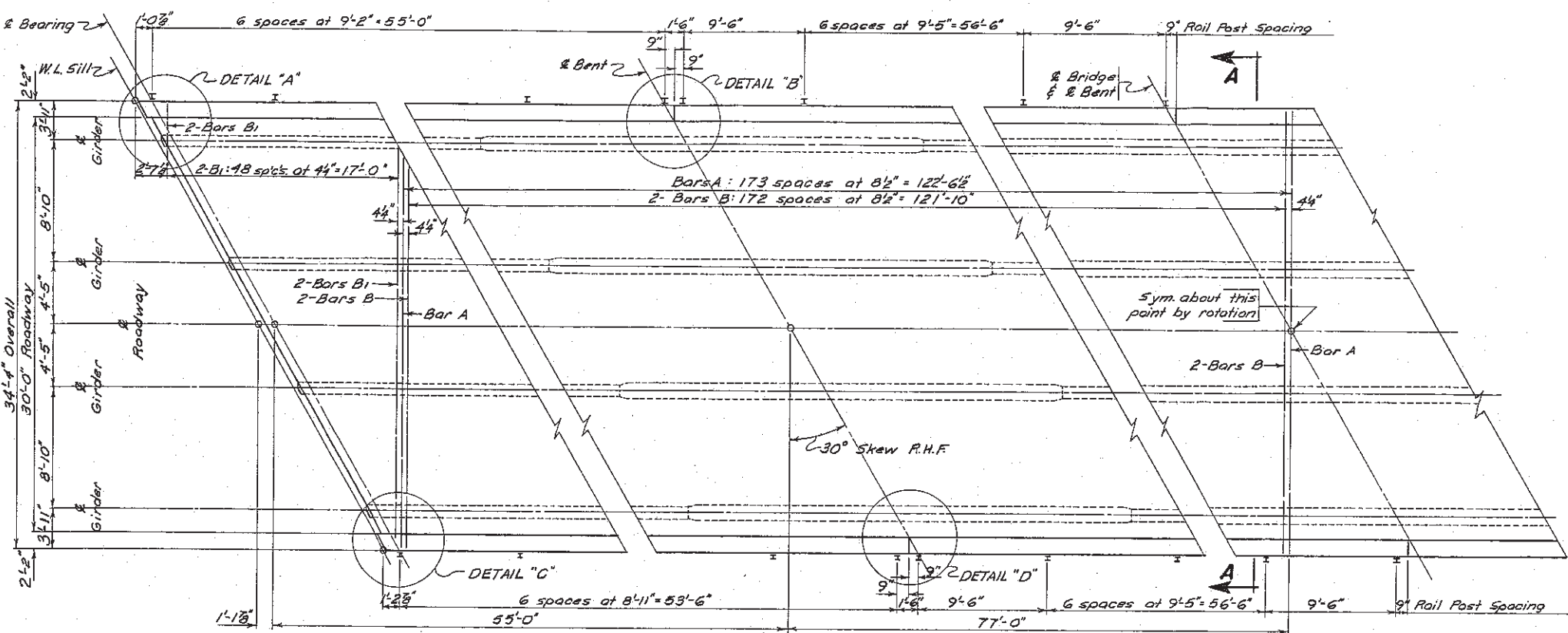
ORIGINAL CONSTRUCTION PLANS

(WEST BOUND LANES)
 LAYOUT FOR UPGRADING
 FOR
266' - 3 3/4" CONT. COMP. GIRDER BRIDGE
 30' - 0" ROADWAY 30° SKEW R.H.F.
 OVER SD 37 SEC. 27-T103N-R60W
 STR. NO. 18-157-107 IM 0907(53)319

DAVISON COUNTY
 S. D. DEPT. OF TRANSPORTATION
 JUNE 2011

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

DESIGNED BY TK DAVS6666	DRAWN BY EJA 6666LC01	CHECKED BY BWS	Kevin N. Boeden BRIDGE ENGINEER
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See Sheet No. 10 of 11 for Railing Details.

HALF PLAN

NOTE- Bars D1, D2 and D3 shall be placed continuously. Lap bars 1'-6".

*Dimensions at & of bearings. At other points along the girders this dimension must be computed as shown on Sheet No. 9 of 11.

REINFORCING SCHEDULE					
Bar	No.	Size	Length	Type	
A	347	5	34'-9"	15	
B	692	5	34'-0"	Str.	
B1	98	5	35'-0"	Str.	
B2	4	5	39'-0"	Str.	
C	532	4	7'-3"	T1	
D1	148	5	36'-6"	Str.	
D2	148	5	40'-0"	Str.	
D3	222	5	40'-0"	Str.	
D4	24	5	28'-6"	Str.	
D5	24	5	39'-0"	Str.	

Bending Details

Sym. Abt. &

A 5'-9 3/8" 4'-4 1/8" 1'-0 3/8" 4'-2 1/8" 17'-0"

2'-9" 32'-3" Type 15

32'-3" 2'-9" B1, 19 Bars

1'-9 1/4" 2'-0" 1'-4" Type T1

NOTE: All dimensions are out to out of bars.

ESTIMATED QUANTITIES			
ITEM	UNIT	QUANTITY	
Class 'A' Concrete	Cu. Yds.	222.5	
Reinforcing Steel	Lbs.	66,195	
Structural Steel	Lbs.	139,575	
Type RT-1 Steel Railing	Ln./Ft.	836.8	

SUPERSTRUCTURE NOTES—

- Design Specifications: AASHTO. Specifications for Highway Bridge, 1961, with Interim Specifications for 1961, 1962, 1963, and 1964.
- Structural Steel members shall conform to A.S.T.M. A36 Steel. Steel produced under other specifications, but shown to possess the chemical and physical properties of A36 Steel will be accepted for use where the latter is specified.
- Cost of welding shall be included in the unit price bid for Structural Steel.
- Structural Steel shall be painted with one shop coat of Red Lead Paint (A.A.S.H.O. designation M72, Type I) or Red Lead Iron Oxide Paint (A.A.S.H.O. designation M72, Type III) and with a coat of gray paint followed by a coat of green paint in accordance with the Special Provisions. Cost of painting shall be included in the unit price bid for Structural Steel.
- All exposed concrete edges shall be chamfered 1" unless otherwise noted.
- Cost of canvas and red lead or preformed fabric pads under bearing plates shall be included in the unit price bid for Structural Steel.
- Design Loading: HS20-44 A.A.S.H.O. and Alternate Loading as designated in PPM 20-4 Sec. 4c. Unit Stresses: Re-Steel $f_s=20,000$ p.s.i.; Concrete $f_c=1600$ p.s.i.
- All reinforcing steel bars shall conform to A.S.T.M. Specifications A305 and A15, Int. Grade.
- Butt welded girder splices, shop or field, shall be radiographically inspected.
- See Standard Railing Sheet for details of railing and curb.
- Expansion shoe shall be set vertical at 70° F.
- Structural Steel for bearings shall conform to A.S.T.M. A36.
- Copper alloy bearing plates shall be as specified on bearing sheet. The weight of these plates shall be computed as Structural Steel and included in that bid item.
- Erection bolts left in place at diaphragms shall be included in the Structural Steel quantity.

ORIGINAL CONSTRUCTION PLANS

(WEST BOUND LANES)

SUPERSTRUCTURE DETAILS

FOR

266'-3 3/4"

CONT. COMP. GIRDER VIADUCT

30'-0" ROADWAY

30° SKEW R.H.F.

OVER S.D. NO. 37 STA. 841+41.61 M.L. SEC. 27-T103N-R60W

STA. 839+80.487 TO 842+49.113 I 90-7(16)328

STR. NO. 18-157-107 DAVISON COUNTY

SOUTH DAKOTA HS 20-44

DEPARTMENT OF HIGHWAYS (B ALT.)

JULY 1964

(14 OF 16)

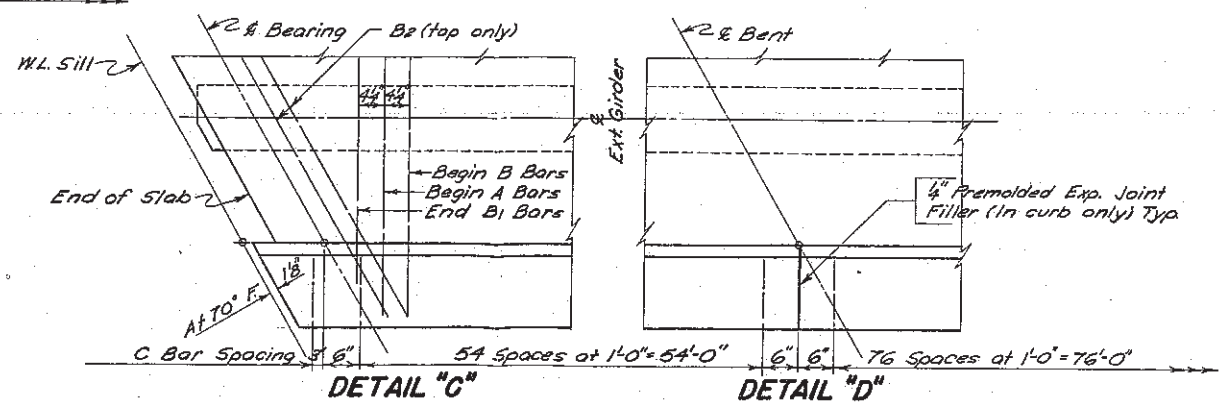
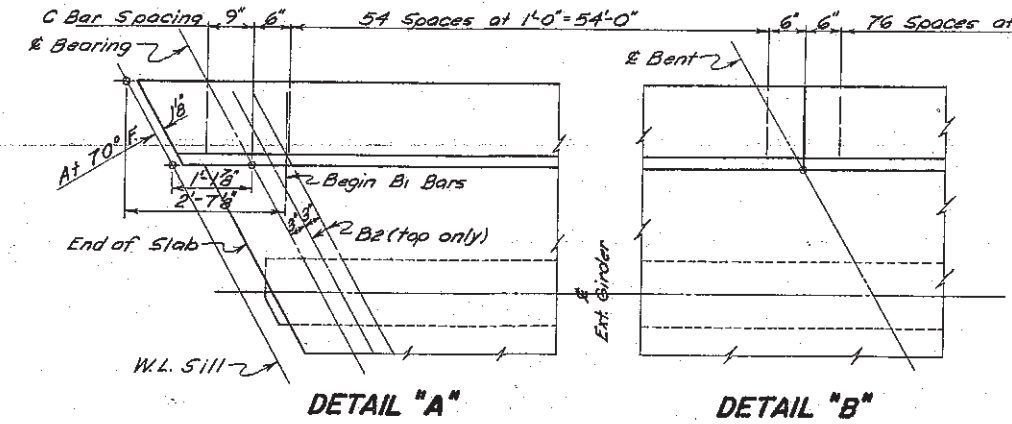
CONCRETE POURING NOTES—

Concrete slab may be poured continuously, provided concrete retarders are used and the Contractor has demonstrated capacity for such continuous operations. Transverse Construction Joints are permitted in the slab and shall be positioned near the girder field splices or at approximately the 1/4 points from the & of Bents.

If transverse construction joints are used, the Contractor shall submit to the Bridge Section for approval, plans and details of construction joints used, as well as a sequence of pouring.

Curbs shall be poured after all of the slab has been poured.

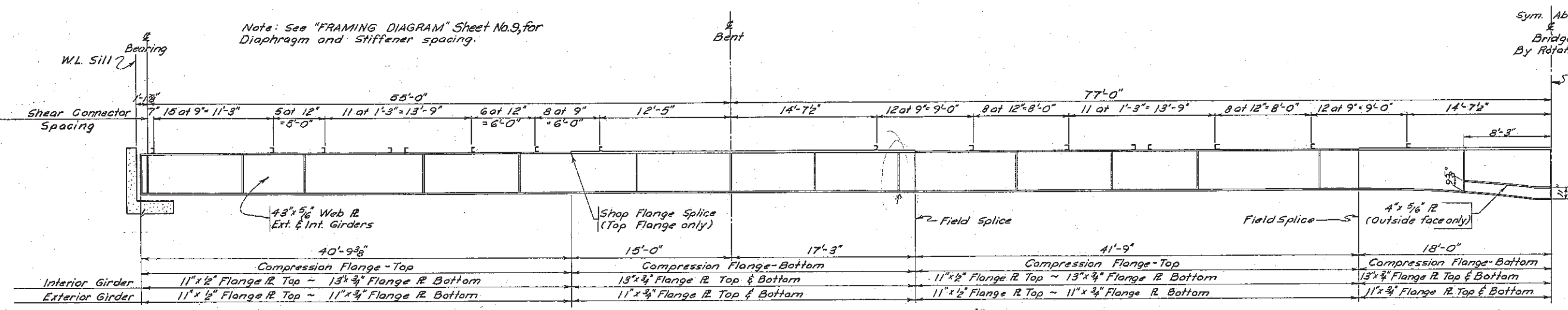
The expansion device shall be blocked off prior to pouring slab. After pouring all the slab, adjust and bolt devices and complete pour.



DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
	GLS	JLH	<i>[Signature]</i>

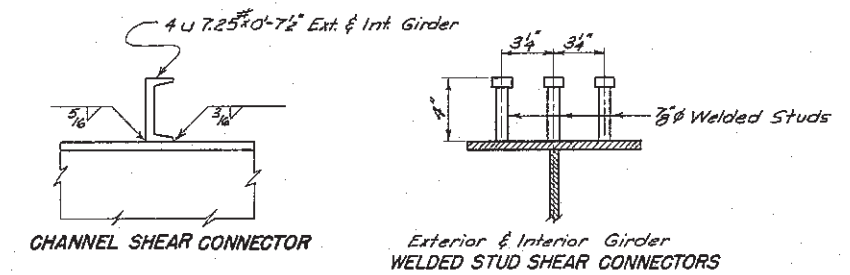
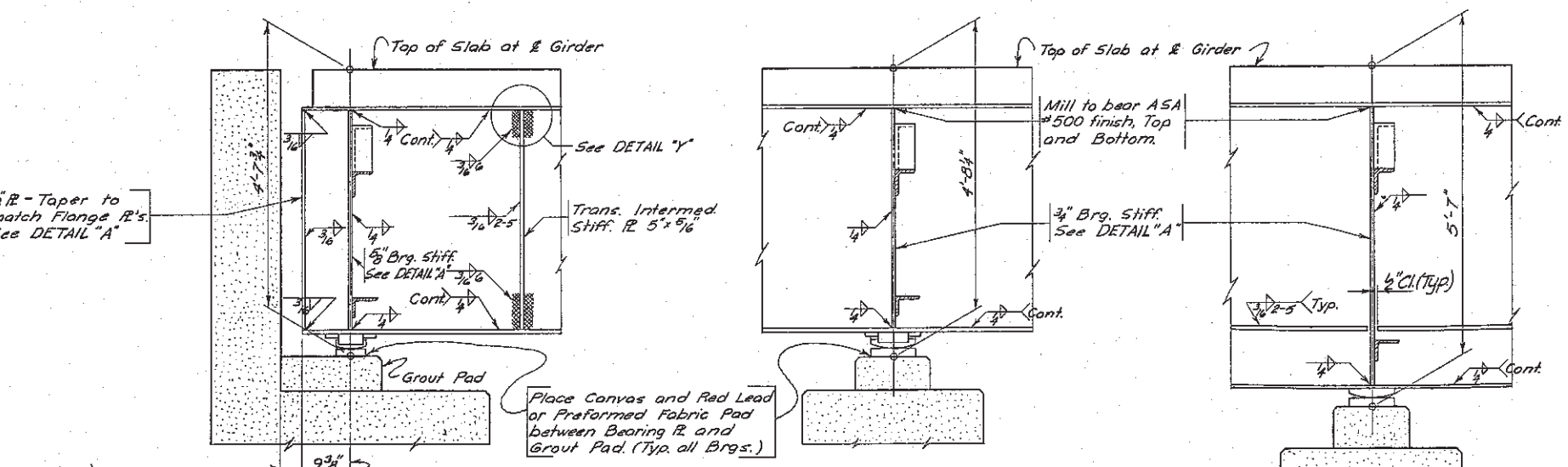
BRIDGE ENGINEER

Note: See "FRAMING DIAGRAM" Sheet No. 9, for Diaphragm and Stiffener spacing.

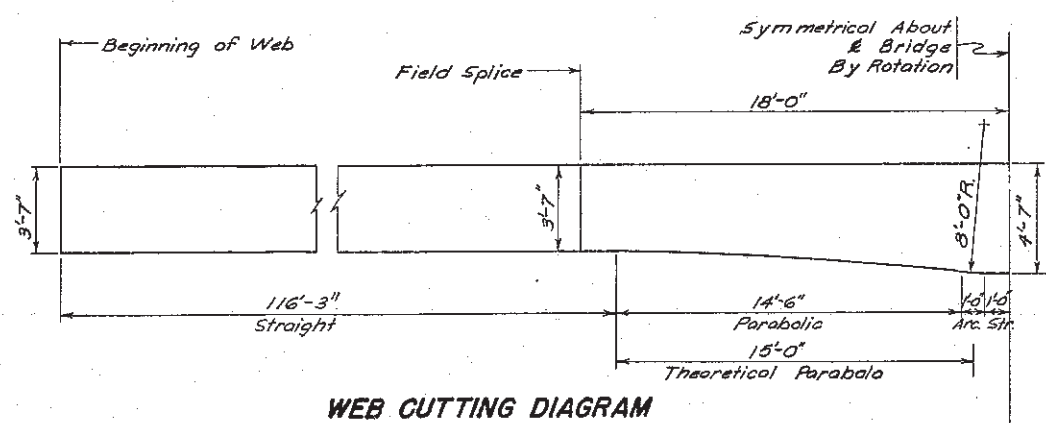
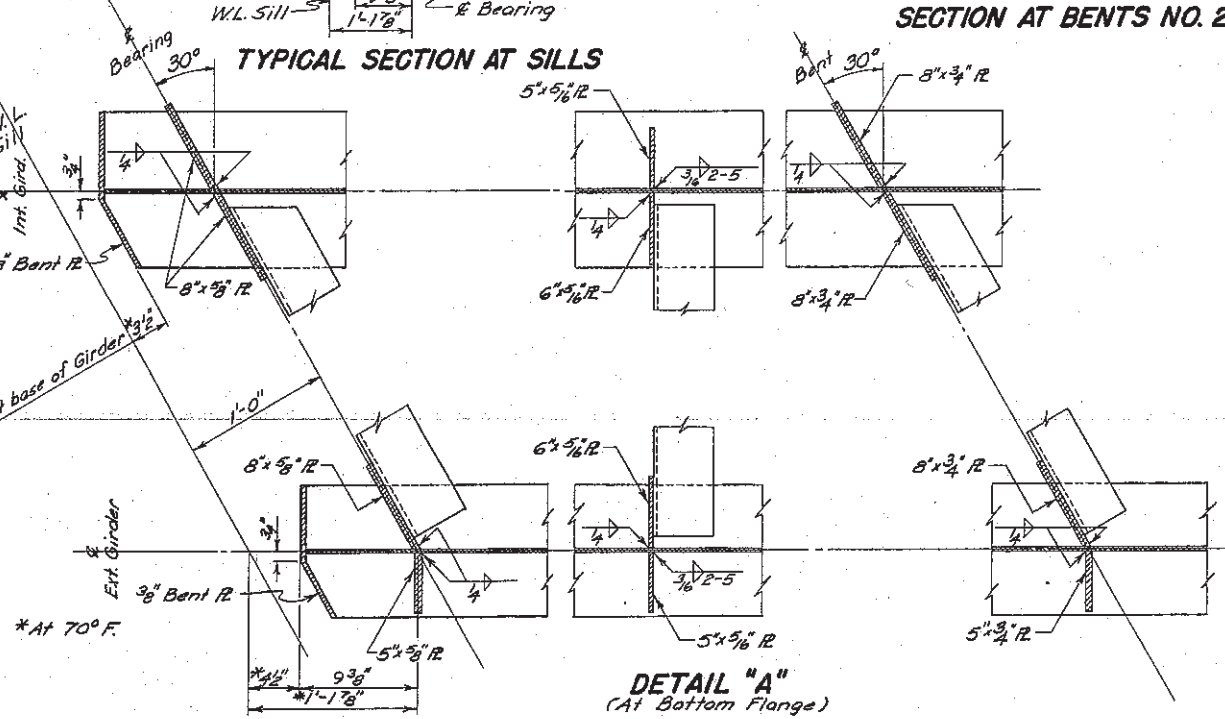


DETAIL "Y"
When stiffener plates are used on one side only, they shall be attached to the out-standing leg of the compression flange as shown. See Girder Layout for location of the compression flange.

GIRDER LAYOUT
(Slab not shown)
(Outside face of Exterior Girder shown)



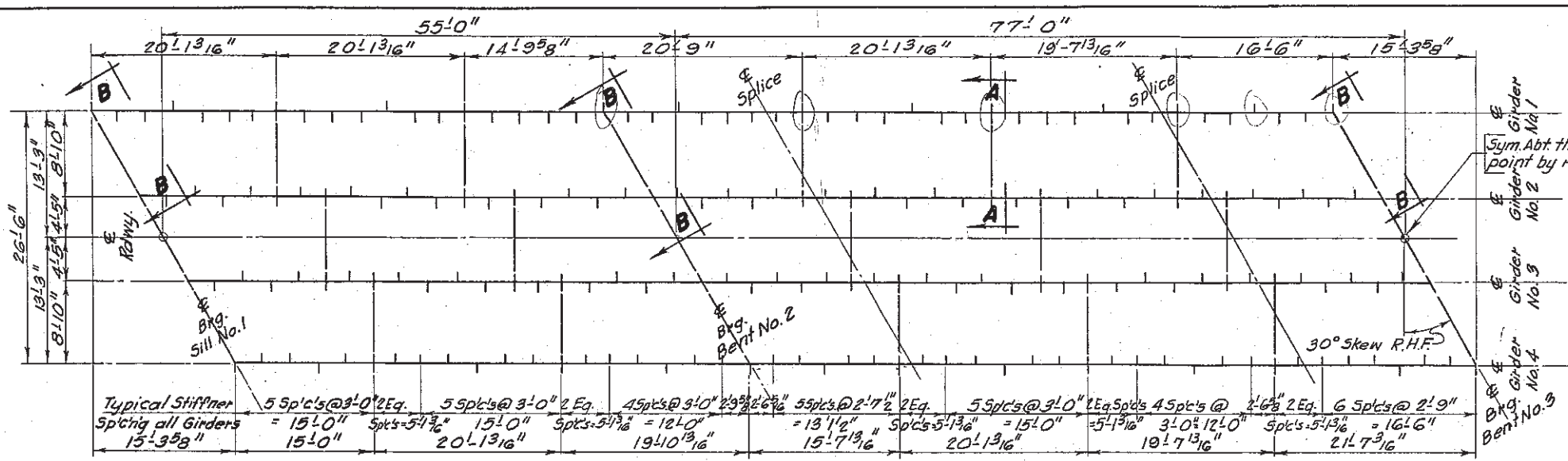
DETAILS OF SHEAR CONNECTORS
Channel or Welded Stud Shear Connectors are spaced as shown above on Girder Layout. The Contractor may substitute a row of 3/8" welded studs for each Channel Shear Connector as shown. Shear Connectors will be paid for as structural steel based on the weight of channels, regardless of type of connector used. Channels shall be placed on the girders facing in the directions as shown on Girder Layout.



ORIGINAL CONSTRUCTION PLANS

(WEST BOUND LANES)
SUPERSTRUCTURE DETAILS
FOR
CONT. COMP GIRDER VIADUCT
30'-0" ROADWAY 30° SKEW R.H.F.
OVER S.D. NO. 37 STA. 841+41.61 M.L. SEC. 27-T103N-R60W
STA. 839+80.487 TO 842+49.113 1 90-7 (6) 328
STR. NO. 18-157-107 DAVISON COUNTY
SOUTH DAKOTA HS20-44
DEPARTMENT OF HIGHWAYS (8 ALT.)
JULY 1964 15 OF 16

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
	GLS	J.L.H.	<i>[Signature]</i> BRIDGE ENGINEER



FRAMING DIAGRAM

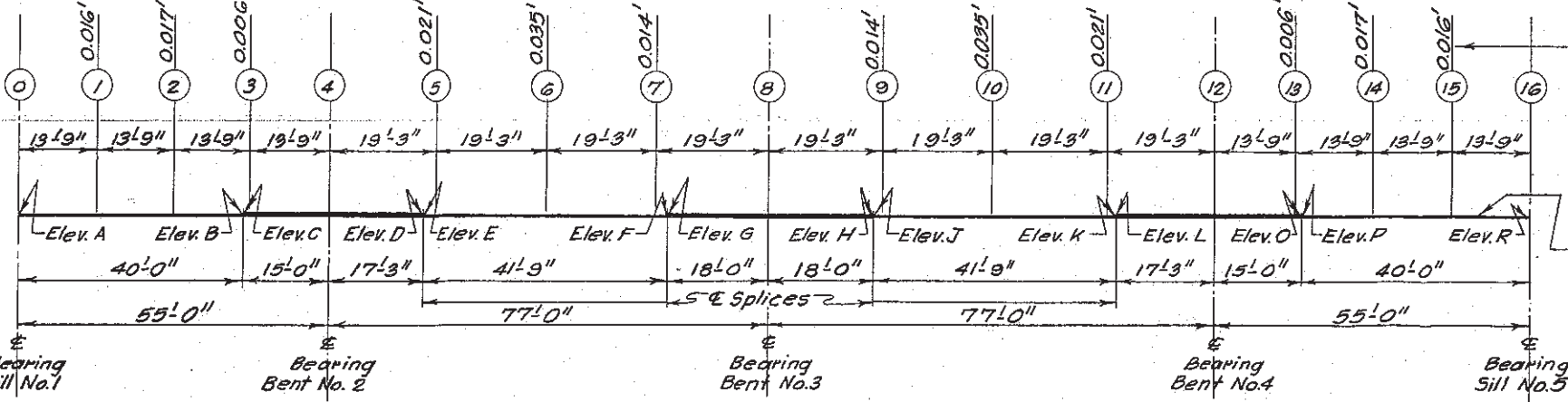
TABLE OF SLAB FORM ELEVATIONS AND COMPUTATIONS

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Elev. M	1355.015	1355.144	1355.259	1355.362	1355.469	1355.649	1355.822	1355.960	1356.105	1356.278	1356.458	1356.603	1356.741	1356.866	1356.985	1357.098	1357.195
(-Elev. N																	
(-d																	
(-0.563																	
(-n																	
Elev. M	1355.195	1355.324	1355.439	1355.541	1355.649	1355.829	1356.002	1356.140	1356.285	1356.458	1356.638	1356.783	1356.921	1357.041	1357.165	1357.278	1357.375
(-Elev. N																	
(-d																	
(-0.563																	
(-n																	
Elev. M	1355.237	1355.366	1355.481	1355.584	1355.691	1355.871	1356.044	1356.182	1356.327	1356.500	1356.680	1356.825	1356.963	1357.083	1357.207	1357.320	1357.417
(-Elev. N																	
(-d																	
(-0.563																	
(-n																	
Elev. M	1355.141	1355.271	1355.385	1355.488	1355.595	1355.775	1355.948	1356.086	1356.231	1356.404	1356.584	1356.730	1356.868	1356.987	1357.112	1357.224	1357.322
(-Elev. N																	
(-d																	
(-0.563																	
(-n																	

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 grade and deflection due to all D.L. above girders. Elevation "N" is a field measured elevation taken on top of girders at 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.

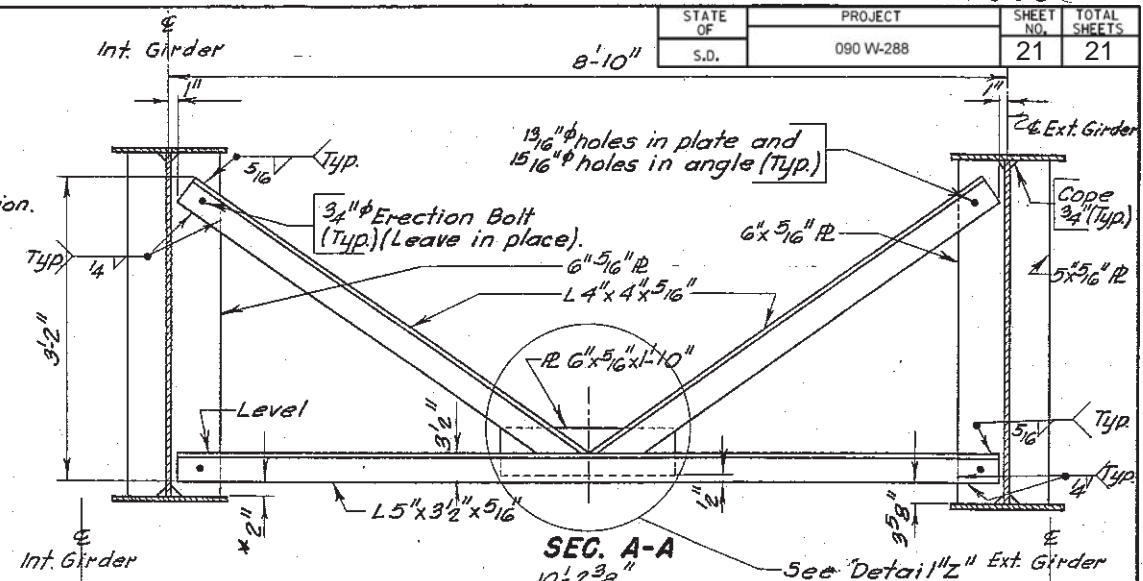
ERECTION ELEVATIONS

Girder No.	Elevations (Top of Girder)													
	A	B	C	D	E	F	G	H	J	K	L	O	P	R
1	1354.411	1354.741	1354.762	1355.028	1355.007	1355.352	1355.373	1355.670	1355.650	1355.994	1356.015	1356.282	1356.261	1356.591
2	1354.591	1354.921	1354.942	1355.208	1355.187	1355.532	1355.553	1355.850	1355.830	1356.174	1356.195	1356.462	1356.441	1356.771
3	1354.633	1354.963	1354.984	1355.250	1355.229	1355.574	1355.595	1355.892	1355.872	1356.216	1356.237	1356.504	1356.483	1356.813
4	1354.537	1354.867	1355.888	1355.155	1355.134	1355.479	1355.499	1355.797	1355.776	1356.121	1356.142	1356.408	1356.387	1356.718

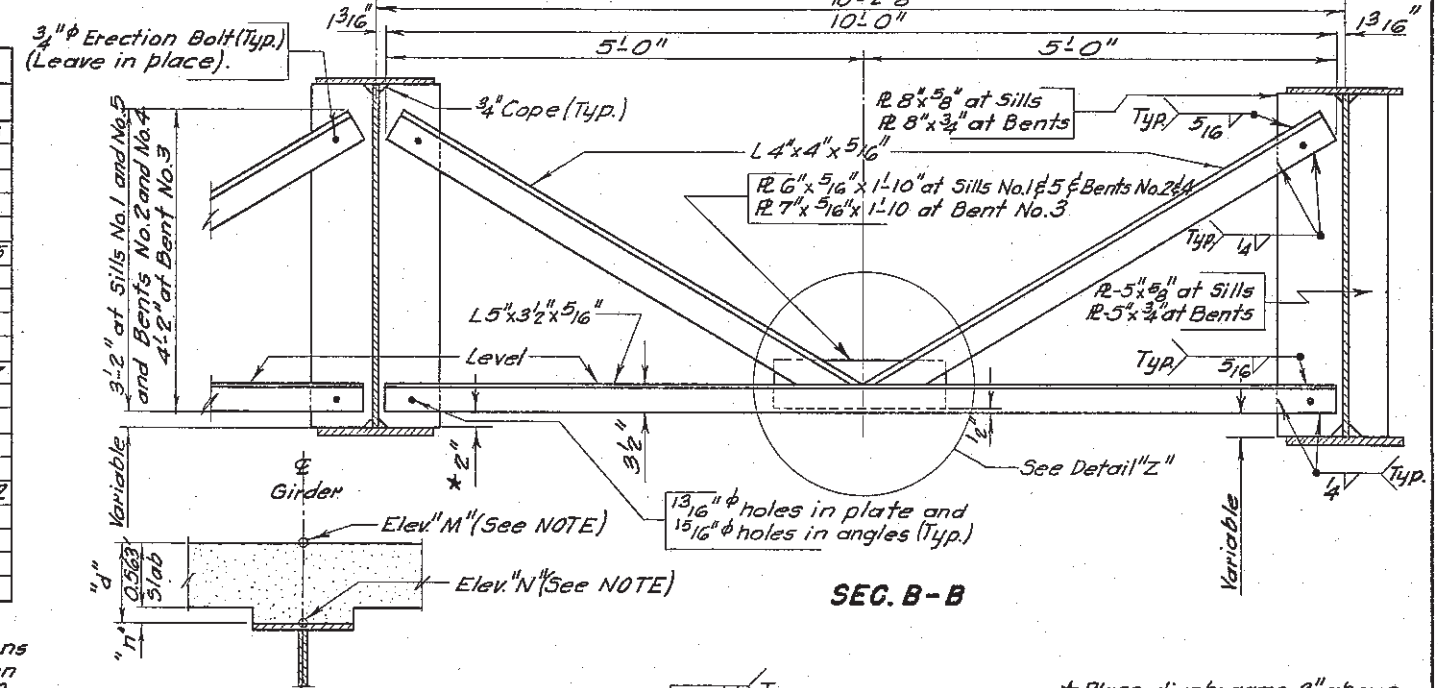


ERECTION ELEVATIONS DIAGRAM

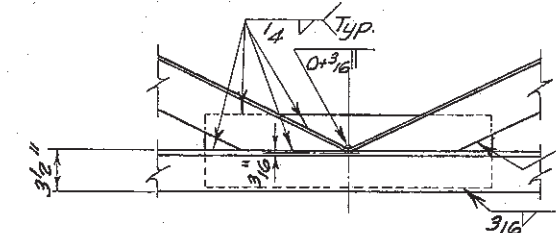
NOTE.- All Girder Slopes are +0.8260 %



SEC. A-A



SEC. B-B



DETAIL "Z"

ORIGINAL CONSTRUCTION PLANS

(WEST BOUND LANES)
FRAMING DIAGRAM AND ERECTION DATA
FOR
CONT. COMP. GIRDER VIADUCT
30'-0" ROADWAY 30° SKEW R.H.F.
OVER S.D. NO. 37 STA. 841+41.61 M.L. SEC. 27-TIO3N-R60W
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