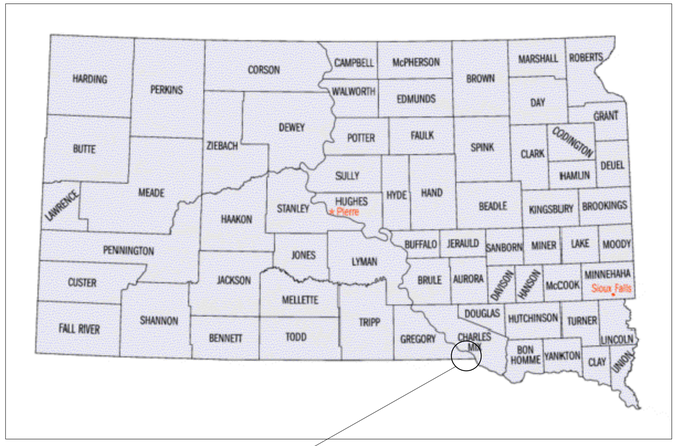
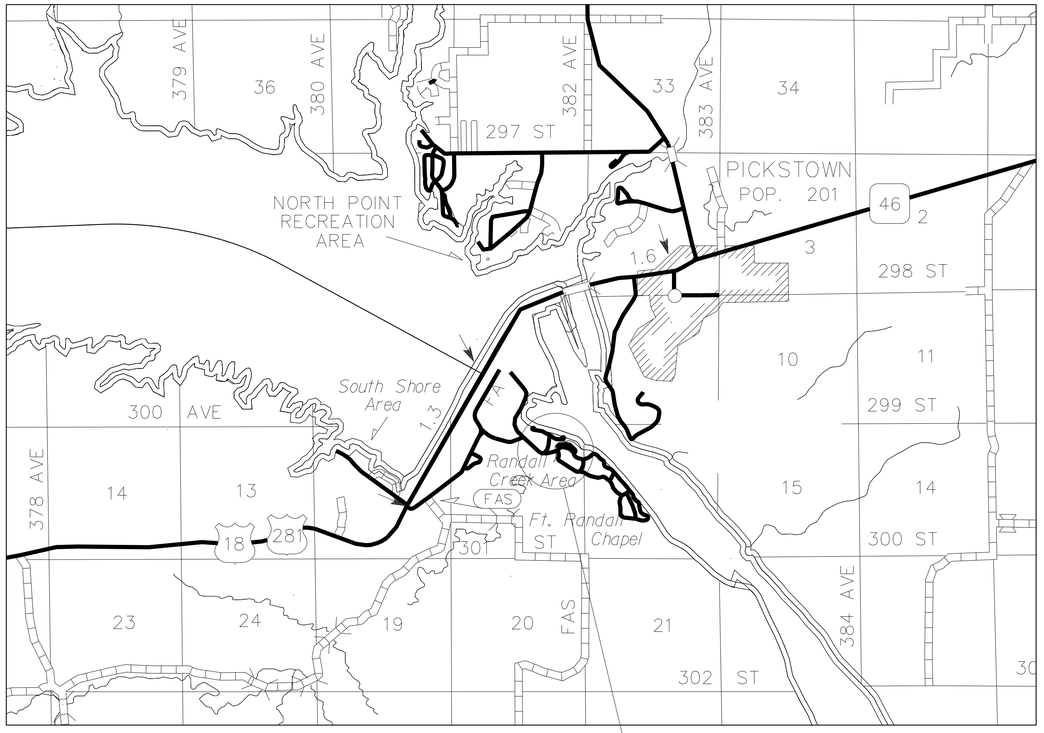
RANDALL CREEK RECREATION AREA
SOUTH DAKOTA DEPARTMENT OF GAME, FISH, AND PARKS
BRIDGE REPLACEMENT
PROJECT NO. RanC20Pa
GREGORY COUNTY, SOUTH DAKOTA
T095N, R 65W, SEC. 17

VICINITY MAP



PROJECT SITE

LOCATION MAP



PROJECT SITE

SOUTH DAKOTA
Game, Fish & Parks

INDEX OF SHEETS

Division of Administration
Foss Building
523 E. Capitol Ave.
Pierre, South Dakota 57501-3182
Phone: (605) 773 - 6082
Department of Game, Fish & Parks

DATE 9/30/2019
REVISION
REVISION
PROJECT NUMBER RANC20PA
DRAWN BY ZJH
CHECKED BY DRB
TITLE HOUSTON ENGINEERING INC
RANDALL CREEK BRIDGE
GREGORY COUNTY, SOUTH DAKOTA
SHEET 1 OF 30

HOUSTON ENGINEERING INC.
Sioux Falls
P: 605.271.0378

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	RanC20Pa	2	30

ESTIMATE OF STRUCTURE QUANTITIES			
BID ITEM NUMBER	ITEM	QUANTITY	UNIT
250E0030	Incidental Work, Structure	1	LS
410E0030	Structural Steel, Miscellaneous	1	LS
420E0030	Structure Excavation, Bridge	1875	CuYd
430E0200	Bridge End Embankment	758	CuYd
430E0300	Granular Bridge End Backfill	256	CuYd
430E0700	Precast Concrete Headw all for Drain	2	Each
460E0060	Class A45 Concrete, Bridge	281.3	CuYd
460E0030	Class A45 Concrete, Bridge Deck	35	CuYd
470E0040	Steel Pedestrian Railing	100	Ft
480E0100	Reinforcing Steel	20440	Lb
480E0200	Epoxy Coated Reinforcing Steel	5710	Lb
510E3521	HP 14x73 Steel Test Pile, Furnish and Drive	210	Ft
510E3521	HP 14x73 Steel Bearing Pile, Furnish and Drive	2600	Ft
680E0040	4" Underdrain Pipe	151	Ft
680E2500	Porous Backfill	22	Ton
560E8560	6.5' Wide Deck Prestress Concrete Bulb Tee	500	Ft

ESTIMATE OF GRADING & PAVING QUANTITIES			
BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	1	LS
100E0100	Clearing	1	LS
110E0020	Remove Bridge Railing	150	Ft
110E0730	Remove Beam Guardrail	50	Ft
110E1010	Remove Asphalt Concrete Pavement	150	SyYd
110E1970	Remove Water Main	100	Ft
110E5020	Salvage Traffic Sign	6	Each
110E5040	Salvage Road Closed Gate	2	Each
230E0100	Remove and Replace Topsoil	1	LS
260E1010	Base Course 12"	100	Ton
320E1200	Asphalt Concrete Composite 6"	50	Ton
451E0514	4" PVC Pipe	100	Ft
451E0704	4" Ductile Iron Water Main	150	Ft
451E3004	4" Ductile Iron Pipe Bends	4	Each
451E9999	4" Pipe Insulation	200	Ft
632E2020	4"x4" White Delineator w ith 1.12Lb/Ft Post	2	Each
632E2530	Type 3 Object Marker	4	Each
634E0120	Traffic Control, Miscellaneous	1	LS

ESTIMATE OF CHANNEL & EROSON CONTROL QUANTITIES			
BID ITEM NUMBER	ITEM	QUANTITY	UNIT
120E0010	Unclassified Excavation	6849	CuYd
120E7050	Backfill Material for Reinforced Slope	1080	CuYd
120E3000	Placing Embankment	1851	CuYd
270E0300	Haul Material	4997	CuYd
700E0310	Class C Riprap	8711	Ton
730E0210	Type F Permanent Seeding Mixture	20	LB
731E0100	Fertilizing	1697	LB
734E0101	Erosion Control Blanket	3734	SqYd
734E0325	Surface Roughening	1.7	Acre
734E0630	Floating Silt Curtain	200	Ft
734E9999	Temporary Stream Crossing	1	LS
831E0110	Type B Drainage Fabric	4343	SqYd

ESTIMATE OF QUANTITIES

FOR

103'-0" DECK BULB TEE GIRDER BRIDGE

RANDALL CREEK RESTORATION AREA

SOUTH DAKOTA DEPARTMENT OF GAME, FISH, & PARKS

OCTOBER 2019

STR. NO. 27498312

DESIGNED BY	CK. DES. BY	DRAFTED BY	
ZJH	DB	ZJH	BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	RanC20Pa	3	30

ENVIRONMENTAL COMMITMENTS

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

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

COMMITMENT B4: BALD EAGLE

Bald eagles are known to occur in this area.

Action Taken/Required:

If a nest is observed within one mile of the project site, notify the Project Engineer immediately so that he/she can consult with the SDGFP Office for an appropriate course of action.

COMMITMENT H: WASTE DISPOSAL SITE

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

Action Taken/Required:

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

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

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

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

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

2. Concrete and asphalt concrete debris may be stockpiled within view of the ROW for a period 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) will be incidental to the various contract items.

COMMITMENT J: CONSTRUCTION PRACTICES FOR TEMPORARY WORKS IN WATERWAYS OF THE U.S.

The Contractor is advised that special construction measures must be taken to ensure that the waterways of the U.S. are not impacted.

Action Taken/Required:

Excavation will not occur below the ordinary high water elevation in waterways outside of caissons, cribs, cofferdams, steel piling, or sheeting. The natural streambed will not be disturbed unless specified by the plans and under the observation of the Project Engineer.

All dredged or excavated materials will be placed at a site above the ordinary high water elevation in a confined area (not classified as a wetland) that is a minimum of 50 feet away from concentrated flows of storm water, drainage courses, and inlets to prevent return of such material to the waterway.

The construction of temporary work platforms, crossings, or berms below the ordinary high water elevation will be allowed if all material placed below the ordinary high water elevation consists of Class B or larger riprap.

All temporary caissons, cribs, cofferdams, steel piling, sheeting, work platforms, crossings, and berms will be removed with minimal disturbance to the streambed. Proper construction practices will be used to minimize increases in suspended solids and turbidity in the waterway.

Bridge berms, wing dams, traffic diversions, channel reconstruction, stream diversions, grading, etc. will be constructed in close conformity with the plans to ensure that the hydraulic capacity of the waterway is not changed.

Temporary waterway crossings required for the Contractor's construction operations will be constructed with an adequate drainage structure size and minimum fill height to reduce the potential for upstream flooding. The Contractor will be responsible for sizing the temporary drainage structure for these crossings.

Table of U.S. Waterways to Protect

Station Waterway Ordinary High Water Elevation 1236.00 (1 FT.) Stream channel excavation within “Waters of the US” is subject to USACE regulatory jurisdiction. Stream channel excavation cannot exceed the permitted quantities and/or surface area. The 404 Permit is included in the Special Provisions.

The Contractor will take all precautions necessary to prevent any incidental discharges associated with the excavation and hauling of material from the stream channel. This pertains to any excavation operations such as, foundation, pier, or abutment excavation, channel cleanout, excavation for riprap protection, and removal of any temporary fill associated with construction activities.

COMMITMENT N: SECTION 404 PERMIT

The SDGFP has obtained a Section 404 Permit from the USACE for the permanent actions associated with this project.

Action Taken/Required:

The Contractor will comply with all requirements contained in the Section 404 Permit.

The Contractor will also be responsible for obtaining a Section 404 Permit for any dredge, excavation, or fill activities associated with material sources, storage areas, waste sites, and Contractor work sites outside the plan work limits that affect wetlands, floodplains, or waters of the United States.

SURFACING THICKNESS DIMENSIONS

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

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

SURFACE ROUGHENING

Surface roughening will be done after topsoil placement and before permanent seeding, fertilizing, and mulching applications. Refer to Standard Plate 734.25 for details.

ASPHALT CONCRETE COMPOSITE

Asphalt Concrete Composite will include MC-70 Asphalt for Prime placed at the rate of 0.30 gallons per square yard. The Asphalt for Prime will be applied to the Base Course, for the full width of the bottom layer of Asphalt Concrete Composite plus one foot additional on the outside shoulder.

Asphalt for tack SS-1h or CSS-1h will be applied prior to each lift of Asphalt Concrete Composite. Asphalt for tack will be applied at a rate of 0.09 gallons per square yard on existing pavement or milled asphalt concrete surfaces and at a rate of 0.06 gallons per square yard on primed base course or new asphalt concrete pavement. The Asphalt for tack will be applied for the full width of the bottom layer of Asphalt Concrete Composite plus one-half foot additional on the outside shoulder.

UTILITIES

The Contractor will be aware that the existing utilities shown in the plans were surveyed prior to the design of this project and might have been relocated or replaced by a new utility facility prior to construction of this project, might be relocated or replaced by a new utility facility during the construction of this project, or might not require adjustment and may remain in its current location. The Contractor will contact each utility owner and confirm the status of all existing and new utility facilities. The utility contact information is provided elsewhere in the plans or bidding documents.

Water pipe shall be flanged ductile iron pipe according to AWWA C115/A21.15. Fittings shall be flanged ductile iron with standard thickness according to AWWA C110/A21.10. Joints shall be rubber gaskets for ductile iron pipe and fittings according to AWWA C111/A21.11. Insulation shall be EPDM rubber-based elastomeric pipe insulation for outdoor cold weather plumbing that is flexible, weather resistant, and can withstand temperatures to zero degrees.

Electrical conduit shall be rigid polyvinyl chloride (PVC) plastic pipe schedule 40 according to ASTM D1785. Fittings shall be rigid PVC plastic pipe schedule 40 according to ASTM D2466. Joints shall be solvent welded according to ASTM D2855.

WATER MAIN DISINFECTION

After disinfection and final flushing and before the new water main is connection to the distribution system, two consecutive sets of acceptable samples, taken 24 hours apart, shall be collected from the new main. The samples must be submitted to a health laboratory acceptable to the SD Game, Fish and Parks. The samples must be free of coliform bacteria before the system can be place into service.

Water that is discharged during water main flushing shall not reach a stream, river or water way if the chlorine residual exceeds 0.05mg/L.

The contractor shall notify all consumers affected by any interruption of water service at least 24 hours before the interruption of water service. Consumers shall be verbally notified when possible. In the event a consumer cannot be verbally notified, a door hanger shall be secured to the most frequently used entrance.

DISCHARGE OF CHLORINATED WATER

Water from the project the is drained into work areas or open trenches must be discharged without impact to the environment. The Contractor shall review locations of discharge hydrants relative to open areas and shall meet with property owners to discuss discharge locations and obtain property owner approval if water will be discharged across their private property.

GENERAL NOTES AND TABLES

FOR

103'-0" DECK BULB TEE GIRDER BRIDGE

RANDALL CREEK RESTORATION AREA

SOUTH DAKOTA DEPARTMENT OF GAME, FISH, & PARKS

OCTOBER 2019

STR. NO. 27498312

DESIGNED BY	CK. DES. BY	DRAFTED BY	
ZJH	DB	ZJH	BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	RanC20Pa	4	30

FLOATING SILT CURTAIN

Floating silt curtains will be installed at locations noted in the table and at locations determined by the Engineer during construction.

The Contractor will determine the water depth and other waterway characteristics such as stream flow velocity and seek technical advice from the manufacturer before ordering the floating silt curtain so that the floating silt curtain installed is the correct type for the individual sites.

The Contractor will install the floating silt curtain in accordance with the manufacturer's installation instructions or as directed by the Engineer.

The Contractor will maintain the floating silt curtains for the duration of the project to ensure continuous protection of the waterway.

A list of known manufacturers of floating silt curtain is shown below for informational purpose. Contractors may also use Engineer approved floating silt curtain from manufacturers that are not included in the list.

ABASCO, LLC
Houston, TX
Phone: 1-800-242-7745
www.abasco.net

Aer-Flo, Inc.
Bradenton, FL
Phone: 1-800-823-7356
www.aerflo.com

American Boom and Barrier Corp.
Cape Canaveral, FL
Phone: 1-800-843-2110
www.abbcoboom.com

ENVIRO-USA, LLC
Cocoa, FL
Phone: 1-321-222-9551
www.enviro-usa.com

Elastec/American Marine, Inc.
Carmi, IL
Phone: 1-618-382-2525
www.turbiditycurtains.com

Geo-Synthetics, LLC (GSI)
Waukesha, WI
Phone: 1-800-444-5523
www.geosynthetics.com

Parker Systems, Inc.
Chesapeake, VA
Phone: 1-866-472-7537
www.parkersystemsinc.com

PERMANENT SEEDING

The areas to be seeded consist of all newly graded areas within the project limits except for the top of roadways, temporary easements under cultivation, and areas designated to be sod.

Type F Permanent Seed Mixture will consist of the following:

Grass Species	Variety	Pure Live Seed (PLS) (Pounds/Acre)
Western Wheatgrass	Arriba, Flintlock, Rodan, Rosana, Walsh	7
Green Needlegrass	Lodorm, AC Mallard Ecovar	4
Sideoats Grama	Butte, Pierre	3
Blue Grama	Bad River	2
Oats or Spring Wheat: April through May; Winter Wheat: August through November		10
		Total: 26

FERTILIZING

The Contractor will apply an all-natural slow release fertilizer prior to seeding or placing sod. The all-natural fertilizer will have a minimum guaranteed analysis of 4-4-4 and be USDA Certified BioBased. It should provide a minimum of 4% (N) nitrogen with a minimum water insoluble nitrogen (WIN) fraction of 2.07%, a minimum of 4% (P_2O_5) available phosphate, a minimum of 4% (K_2O) soluble potash, and a maximum carbon to nitrogen ratio (C:N ratio) of 5:1. The all-natural fertilizer will be free of weed-seed and pathogens accomplished through thermophilic composting, and not mechanical or chemical sterilization, to assure presence of beneficial soil microbiology. The fertilizer will have a near neutral pH, a low salt index, a low biological oxygen demand, contain organic humic and fulvic acids, and have high aerobic organism counts. The fertilizer will also be stable, free of bad odors, and be unattractive as a food source for animals. It should also be in a granular form that is easily spread.

The fertilizer will be applied at a rate of 2,000 pounds per acre in accordance with the manufacturer's recommended method of application.

The all-natural slow release fertilizer will be as shown below or an approved equal:

Product	Manufacturer
Sustane	Sustane Corporate Headquarters Cannon Falls, Minnesota Phone: 1-800-352-9245 www.sustane.com
Perfect Blend	Perfect Blend, LLC Bellevue, WA Phone: 1-866-456-8890 www.perfect-blend.com

EROSION CONTROL BLANKET

The erosion control blanket provided will be from the approved product list. The approved product list for erosion control blanket may be viewed at the following internet site:

http://sddot.com/business/certification/products/Default.aspx

An additional quantity of Erosion Control Blanket has been added to the Estimate of Quantities for temporary erosion control.

AQUATIC INVASIVE SPECIES PREVENTION GUIDELINES FOR CONTRACTORS AND CONSTRUCTION EQUIPMENT

Aquatic Invasive Species (AIS) are a significant threat to the biodiversity and ecological health of the aquatic resources of South Dakota. These species have the potential to dramatically alter the ecology of a lake or river, impose substantial economic costs to maintain water infrastructure and decrease the recreational value and use of a waterbody. While South Dakota has largely remained free of AIS, the recent discovery of a Zebra Mussel infestation highlights the need to prevent the introduction of AIS that may impact the aquatic resources of the state.

A major vector for the movement of AIS into the state is the interstate transport of construction equipment. Some areas of the United States, especially the Great Lakes Region, have established AIS populations that currently do not exist or exist in limited areas of South Dakota. It is essential that the following guidelines are followed to prevent these species from establishing throughout South Dakota.

- Any boat, barge or floating structure must be transported with all drain plugs, valves, bailers or similar devices removed or open when not being launched or loaded. (SD Administrative Rule 41:10:04:03). When possible, any equipment that will be used in or on a waterbody should be allowed to dry for at least seven days prior to launching in a South Dakota waterbody.
- Any boat, barge or floating structure or equipment that has significant dried organic matter or mud on the exterior surfaces should be powerwashed prior to launching in a South Dakota waterbody.
- Any boat, barge or floating structure or equipment that has been used in the Great Lakes watershed or in a waterbody known to be infested with zebra or quagga mussels within the past 30 days shall be inspected for the presence of AIS prior to use. All interior compartments or storage holds should be free of standing water.
- Any boat, barge or floating structure or equipment that has been used in the Great Lakes watershed or in a waterbody known to be infested with zebra or quagga mussels within the past 7 days shall be decontaminated with a hot-water power wash, or shall be allowed to completely dry. In addition all boats, barges, floating structures and equipment shall be inspected for the presence of AIS by a SDGFP representative prior to use within South Dakota. All interior compartments or storage holds should be free of standing water.

Additional information on construction equipment cleaning and decontamination techniques can be found at: http://www.usbr.gov/mussels/prevention/docs/EquipmentInspectionandCleaningManual2010.pdf

GENERAL NOTES AND TABLES

FOR

103'-0" DECK BULB TEE GIRDER BRIDGE

RANDALL CREEK RESTORATION AREA

SOUTH DAKOTA DEPARTMENT OF GAME, FISH, & PARKS

OCTOBER 2019
STR. NO. 27498312

DESIGNED BY	CK. DES. BY	DRAFTED BY	
ZJH	DB	ZJH	BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	RanC20Pa	5	30

STORMWATER POLLUTION PREVENTION PLAN CHECKLIST

*(The numbers left of the title headings are **reference numbers** to the GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES (Stormwater Permit))*

5.3 (2): STAFF TRAINING/SWPPP IMPLEMENTATION

To promote stormwater management awareness specific for this project, the Contractor's Erosion Control Supervisor should provide correspondence of how the SWPPP will be implemented. The Contractor's Erosion Control Supervisor is responsible for providing this information at the preconstruction meeting, and subsequently completing an attendance log, which should identify site-specific implementation of the SWPPP and the names of the personnel who attended the preconstruction meeting. Documentation of the preconstruction meeting will be filed with the SWPPP documents.

5.3 (3): DESCRIPTION OF CONSTRUCTION ACTIVITIES

- **5.3 (3a): Project Limits** (See Title Sheet)
- **5.3 (3a): Project Description** (See Title Sheet)
- **5.3 (4): Site Map(s)** (See Title Sheet and Plans)
- **Major Soil Disturbing Activities** (check all that apply)
  - ☐ Clearing and grubbing
  - ☒ Excavation/borrow
  - ☒ Grading and shaping
  - ☒ Filling
  - ☐ Other (describe):
- **5.3 (3b): Total Project Area** 2 Acres
- **5.3 (3b): Total Area to be Disturbed** 2 Acres
- **5.3 (3c): Maximum Area Disturbed at One Time** 2 Acres
- **5.3 (3d): Existing Vegetative Cover (%)** 100%
- **5.3 (3d): Description of Vegetative Cover** Grass, Trees, Shrubs

- **5.3 (3e): Soil Properties:** See Soils Report
- **5.3 (3f): Name of Receiving Water Body/Bodies** Randall Creek
- **5.3 (3g): Location of Construction Support Activity Areas** Randall Creek Campground

5.3 (3h): ORDER OF CONSTRUCTION ACTIVITIES

- **Special sequencing requirements (**see sheet).

The Contractor will enter the Estimated Start Date.

Description	Estimated Start Date
Install perimeter protection where runoff may exit site.	
Install perimeter protection around stockpiles.	
Install channel and ditch bottom protection.	
Clearing and grubbing.	
Remove and stockpile topsoil.	
Stabilize disturbed areas.	
Final grading.	
Final paving.	
Removal of protection devices.	
Reseed areas disturbed by removal activities.	

5.3 (5): DESCRIPTION AND MAINTENANCE OF CONTROL MEASURES

All controls will be maintained in good working order. Necessary repairs will be initiated within 24 hours of the site inspection report. Include the technical reasoning for selecting each control. (check all that apply)

Perimeter Controls (See Detail Plan Sheets)

Description	Estimated Start Date
☐ Natural Buffers (within 50 ft of Waters of State)	
☐ Silt Fence	
☐ Erosion Control Wattles	
☐ Temporary Berm / Windrow	
☒ Floating Silt Curtain	
☐ Stabilized Construction Entrances	
☐ Entrance/Exit Equipment Tire Wash	
☐ Other:	

Structural Erosion and Sediment Controls

Description	Estimated Start Date
☐ Silt Fence	
☐ Temporary Berm/Windrow	
☐ Erosion Control Wattles	
☐ Temporary Sediment Barriers	
☐ Erosion Bales	
☐ Temporary Slope Drain	
☐ Turf Reinforcement Mat	
☒ Riprap	
☐ Gabions	
☐ Rock Check Dams	
☐ Sediment Traps/Basins	
☐ Culvert Inlet Protection	
☐ Transition Mats	
☐ Median/Area Drain Inlet Protection	
☐ Curb Inlet Protection	
☐ Interceptor Ditch	
☐ Concrete Washout Facility	
☐ Work Platform	
☐ Temporary Water Barrier	
☒ Temporary Water Crossing	
☐ Permanent Stormwater Ponds	
☐ Permanent Open Vegetated Swales	
☐ Natural Depressions to allow for Infiltration	
☐ Sequential Systems that combine several practices	
☐ Other:	

Dust Controls

Description	Estimated Start Date
☐ Tarps & Wind impervious fabrics	
☐ Watering	
☐ Stockpile location/orientation	
☐ Dust Control Chlorides	
☐ Other	

Dewatering BMPs

Description	Estimated Start Date
☐ Sediment Basins	
☐ Dewatering bags	
☐ Weir tanks	
☐ Temporary Diversion Channel	
☐ Other:	

Stabilization Practices (See Detail Plan Sheets)

(Stabilization measures shall begin the following work day whenever earth disturbing activity on any portion of the site has temporarily or permanently ceased. Temporary stabilization shall be completed as soon as practicable but no later than 14 days after initiating soil stabilization activities (**3.18**))

Description	Estimated Start Date
☐ Vegetation Buffer Strips	
☐ Temporary Seeding (Cover Crop Seeding)	
☒ Permanent Seeding	
☐ Sodding	
☐ Planting (Woody Vegetation for Soil Stabilization)	
☐ Mulching (Grass Hay or Straw)	
☐ Fiber Mulching (Wood Fiber Mulch)	
☐ Soil Stabilizer	
☐ Bonded Fiber Matrix	
☐ Fiber Reinforced Matrix	
☒ Erosion Control Blankets	
☒ Surface Roughening (e.g. tracking)	
☐ Other:	

Wetland Avoidance

Will construction and/or erosion and sediment controls impinge on regulated wetlands? Yes ☐ No ☒ If yes, the structural and erosion and sediment controls have been included in the total project wetland impacts and have been included in the 404 permit process with the USACE.

LEGEND SHEET

FOR

103'-0" DECK BULB TEE GIRDER BRIDGE

RANDALL CREEK RESTORATION AREA

SOUTH DAKOTA DEPARTMENT OF GAME, FISH, & PARKS

OCTOBER 2019

STR. NO. 27498312

1 OF 3

DESIGNED BY	CK. DES. BY	DRAFTED BY	
ZJH	DRB	ZJH	BRIDGE ENGINEER

5.3 (6): PROCEDURES FOR INSPECTIONS

- Inspections will be conducted at least once every 7 days.
- All controls will be maintained in good working order. Necessary repairs will be initiated within 24 hours of the site inspection report.
- Silt fence will be inspected for depth of sediment and for tears to ensure the fabric is securely attached to the posts and that the posts are well anchored. Sediment buildup will be removed from the silt fence when it reaches 1/3 of the height of the silt fence.
- Sediment basins and traps will be checked. Sediment will be removed when depth reaches approximately 50 percent of the structure's capacity, and at the conclusion of the construction.
- Check dams will be inspected for stability. Sediment will be removed when depth reaches ½ the height of the dam.
- All seeded areas will be checked for bare spots, washouts, and vigorous growth free of significant weed infestations.
- Inspection and maintenance reports will be prepared for each site inspection, this form will also be used to document changes to the SWPPP. A copy of the completed inspection form will be filed with the SWPPP documents.
- The SDGFP Project Engineer and Contractor's Erosion Control Supervisor are responsible for inspections. Maintenance and repair activities are the responsibility of the Contractor. The SDGFP Project Engineer will complete the inspection and maintenance reports and distribute copies.

5.3 (7): POST CONSTRUCTION STORMWATER MANAGEMENT

Stormwater management will be handled by temporary controls outlined in "DESCRIPTION AND MAINTENANCE OF CONTROL MEASURES" above, and any permanent controls needed to meet permanent stormwater management needs in the post construction period will be shown in the plans and noted as permanent.

5.3 (8): POLLUTION PREVENTION PROCEDURES

5.3 (8a): Spill Prevention and Response Procedures

Material Management

Housekeeping

- Only needed products will be stored on-site by the Contractor.
- Except for bulk materials the contractor will store all materials under cover and/or in appropriate containers.
- Products must be stored in original containers and labeled.
- Material mixing will be conducted in accordance with the manufacturer's recommendations.
- When possible, all products will be completely used before properly disposing of the container off-site.
- The manufacturer's directions for disposal of materials and containers will be followed.
- The Contractor's site superintendent will inspect materials storage areas regularly to ensure proper use and disposal.
- Dust generated will be controlled in an environmentally safe manner.

Hazardous Materials

- Products will be kept in original containers unless the container is not resealable and provide secondary containment as applicable.
- Original labels and material safety data sheets will be retained in a safe place to relay important product information.
- If surplus product must be disposed of, manufacturer's label directions for disposal will be followed.
- Maintenance and repair of all equipment and vehicles involving oil changes, hydraulic system drain down, de-greasing operations, fuel tank drain down and removal, and other activities which may result in the accidental release of contaminants will be conducted on an impervious surface and under cover during wet weather to prevent the release of contaminants onto the ground.
- Wheel wash water will be collected and allowed to settle out suspended solids prior to discharge. Wheel wash water will not be discharged directly into any stormwater system or stormwater treatment system.
- Potential pH-modifying materials such as: bulk cement, cement kiln dust, fly ash, new concrete washings, concrete pumping, residuals from concrete saw cutting (either wet or dry), and mixer washout waters will be collected on site and managed to prevent contamination of stormwater runoff.

Spill Control Practices

In addition to the previous housekeeping and management practices, the following practices will be followed for spill prevention and cleanup if needed.

- For all hazardous materials stored on site, the manufacturer's recommended methods for spill cleanup will be clearly posted. Site personnel will be made aware of the procedures and the locations of the information and cleanup supplies.
- Appropriate cleanup materials and equipment will be maintained by the Contractor in the materials storage area on-site. As appropriate, equipment and materials may include items such as brooms, dust pans, mops, rags, gloves, goggles, kitty litter, sand, sawdust, and plastic and metal trash containers specifically for cleanup purposes.
- All spills will be cleaned immediately after discovery and the materials disposed of properly.
- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.
- After a spill a report will be prepared describing the spill, what caused it, and the cleanup measures taken. The spill prevention plan will be adjusted to include measures to prevent this type of spill from reoccurring, as well as clean up instructions in the event of reoccurrences.
- The Contractor's site superintendent, responsible for day-to-day operations, will be the spill prevention and cleanup coordinator.

Spill Response

The primary objective in responding to a spill is to quickly contain the material(s) and prevent or minimize migration into stormwater runoff and conveyance systems. If the release has impacted on-site stormwater, it is critical to contain the released materials on-site and prevent their release into receiving waters. If a spill of pollutants threatens stormwater or surface water at the site, the spill response procedures outlined below must be implemented in a timely manner to prevent the release of pollutants.

- The Contractor's site superintendent will be notified immediately when a spill or the threat of a spill is observed. The superintendent will assess the situation and determine the appropriate response.
- If spills represent an imminent threat of escaping erosion and sediment controls and entering receiving waters, personnel will be directed to respond immediately to contain the release and notify the superintendent after the situation has been stabilized.
- Spill kits containing appropriate materials and equipment for spill response and cleanup will be maintained by the Contractor at the site.
- If oil sheen is observed on surface water (e.g. settling ponds, detention ponds, swales), action will be taken immediately to remove the material causing the sheen. The Contractor will use appropriate materials to contain and absorb the spill. The source of the oil sheen will also be identified and removed or repaired as necessary to prevent further releases.
- If a spill occurs the superintendent or the superintendent's designee will be responsible for completing the spill reporting form and for reporting the spill to SDDENR.
- Personnel with primary responsibility for spill response and cleanup will receive training by the Contractor's site superintendent or designee. The training must include identifying the location of the spill kits and other spill response equipment and the use of spill response materials.
- Spill response equipment will be inspected and maintained as necessary to replace any materials used in spill response activities.

5.3 (8b): WASTE MANAGEMENT PROCEDURES

Waste Disposal

- All liquid waste materials will be collected and stored in approved sealed containers. All trash and construction debris from the site will be deposited in the approved containers. Containers will be serviced as necessary, and the trash will be hauled to an approved disposal site or licensed landfill. All onsite personnel will be instructed in the proper procedures for waste disposal and notices stating proper practices will be posted. The Contractor is responsible for ensuring waste disposal procedures are followed.

Hazardous Waste

- All hazardous waste materials will be disposed of in a manner specified by local or state regulations or by the manufacturer. Site personnel will be instructed in these practices, and the Contractor will be responsible for seeing that these practices are followed.

Sanitary Waste

- Portable sanitary facilities will be provided on all construction sites. Sanitary waste will be collected from the portable units which must be secured to prevent tipping and serviced in a timely manner by a licensed waste management Contractor or as required by any local regulations.

LEGEND SHEET

FOR

103'-0" DECK BULB TEE GIRDER BRIDGE

RANDALL CREEK RESTORATION AREA

SOUTH DAKOTA DEPARTMENT OF GAME, FISH, & PARKS

OCTOBER 2019

STR. NO. 27498312

DESIGNED BY	CK. DES. BY	DRAFTED BY	
ZJH	DRB	ZJH	BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	RanC20Pa	7	30

5.3 (9): CONSTRUCTION SITE POLLUTANTS

The following materials or substances are expected to be present on the site during the construction period. These materials will be handled as noted under the heading "POLLUTION PREVENTION PROCEDURES" (check all that apply).

- ☒ Concrete and Portland Cement
- ☐ Detergents
- ☐ Paints
- ☐ Metals
- ☒ Bituminous Materials
- ☐ Petroleum Based Products
- ☐ Diesel Exhaust Fluid
- ☐ Cleaning Solvents
- ☒ Wood
- ☐ Cure
- ☐ Texture
- ☒ Chemical Fertilizers
- ☐ Other:

Product Specific Practices

- **Petroleum Products**
  All on-site vehicles will be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers which are clearly labeled.

- **Fertilizers**
  Fertilizers will be applied only in the amounts specified by the SDDOT. Once applied, fertilizers will be worked into the soil to limit the exposure to stormwater. Fertilizers will be stored in an enclosed area. The contents of partially used fertilizer bags will be transferred to sealable containers to avoid spills.

- **Paints**
  All containers will be tightly sealed and stored when not required for use. The excess will be disposed of according to the manufacturer's instructions and any applicable state and local regulations.

- **Concrete Trucks**
  Contractors will provide designated truck washout facilities on the site. These areas must be self-contained and not connected to any stormwater outlet of the site. Upon completion of construction, the area at the washout facility will be properly stabilized.

5.3 (10): NON-STORMWATER DISCHARGES

The following non-stormwater discharges are anticipated during the course of this project (check all that apply).

- ☒ Discharges from water line flushing.
- ☐ Pavement wash-water, where no spills or leaks of toxic or hazardous materials have occurred.
- ☐ Uncontaminated ground water associated with dewatering activities.

5.3 (11): INFEASIBILITY DOCUMENTATION

If it is determined to be infeasible to comply with any of the requirements of the Stormwater Permit, the infeasibility determination must be thoroughly documented in the SWPPP.

7.0: SPILL NOTIFICATION

In the event of a spill, the Contractor's site superintendent will make the appropriate notification(s), consistent with the following procedures:

- A release or spill of a regulated substance (includes petroleum and petroleum products) must be reported to SDDENR immediately **if any one of the following** conditions exists:
  - The release or spill threatens or is able to threaten waters of the state (surface water or ground water)
  - The release or spill causes an immediate danger to human health or safety
  - The release or spill exceeds 25 gallons
  - The release or spill causes a sheen on surface water
  - The release or spill of any substance that exceeds the ground water quality standards of ARSD Chapter 74:54:01
  - The release or spill of any substance that exceeds the surface water quality standards of ARSD Chapter 74:51:01
  - The release or spill of any substance that harms or threatens to harm wildlife or aquatic life
  - The release or spill is required to be reported according to Superfund Amendments and Reauthorization Act (SARA) Title III List of Lists, Consolidated List of Chemicals Subject to Reporting Under the Emergency Planning and Community Right to Know Act, US Environmental Protection Agency.

- To report a release or spill, call SDDENR at 605-773-3296 during regular office hours (8 a.m. to 5 p.m. Central Standard Time). To report the release after hours, on weekends or holidays, call South Dakota Emergency Management at 605-773-3231. Reporting the release to SDDENR does not meet any obligation for reporting to other state, local, or federal agencies. Therefore, you must also contact local authorities to determine the local reporting requirements for releases. A written report of the unauthorized release of any regulated substance, including quantity discharged, and the location of the discharge shall be sent to SDDENR within 14 days of the discharge.

LEGEND SHEET

FOR

103'-0" DECK BULB TEE GIRDER BRIDGE

RANDALL CREEK RESTORATION AREA

SOUTH DAKOTA DEPARTMENT OF GAME, FISH, & PARKS

OCTOBER 2019

STR. NO. 27498312

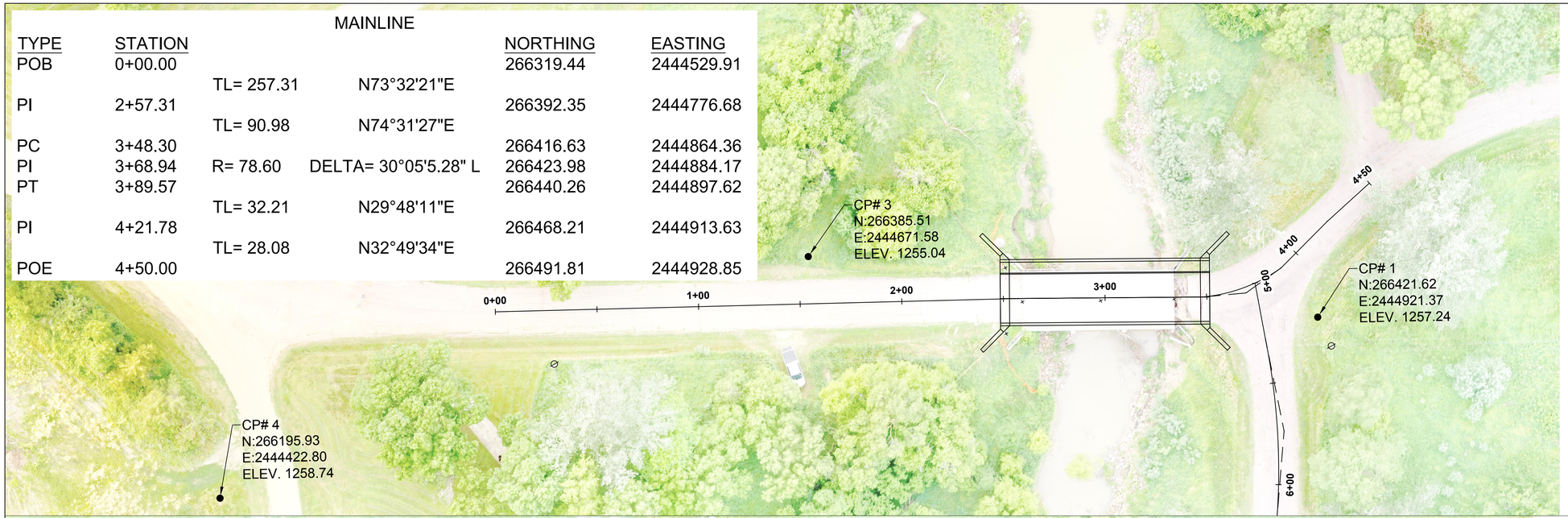
3 OF 3

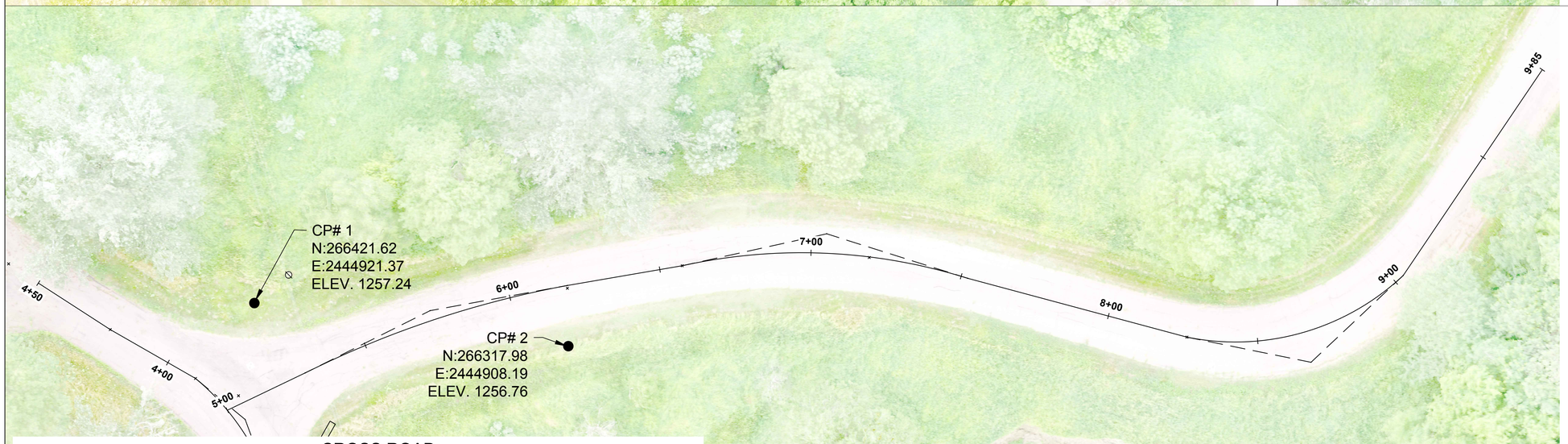
DESIGNED BY	CK. DES. BY	DRAFTED BY	
ZJH	DRB	ZJH	BRIDGE ENGINEER

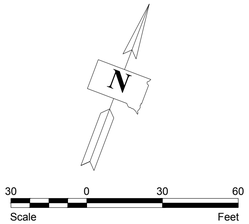
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	RanC20Pa	8	30

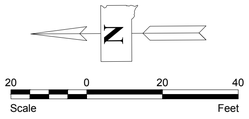
MAINLINE

TYPE	STATION			NORTHING	EASTING
POB	0+00.00			266319.44	2444529.91
		TL= 257.31	N73°32'21"E		
PI	2+57.31			266392.35	2444776.68
		TL= 90.98	N74°31'27"E		
PC	3+48.30			266416.63	2444864.36
PI	3+68.94	R= 78.60	DELTA= 30°05'5.28" L	266423.98	2444884.17
PT	3+89.57			266440.26	2444897.62
		TL= 32.21	N29°48'11"E		
PI	4+21.78			266468.21	2444913.63
		TL= 28.08	N32°49'34"E		
POE	4+50.00			266491.81	2444928.85









CROSS ROAD

TYPE	STATION			NORTHING	EASTING
POB	5+00.00			266429.83	2444887.21
		TL= 28.28	S25°33'59"E		
PC	5+28.28			266404.32	2444899.41
PI	5+73.76	R= 324.16	DELTA= 16°04'35.40" R	266363.34	2444919.82
PT	6+19.24			266318.31	2444928.07
		TL= 38.20	S59°45'08"E		
PC	6+57.44			266280.66	2444934.54
PI	7+04.87	R= 181.55	DELTA= 29°56'13.56" R	266233.26	2444945.00
PT	7+52.30			266186.96	2444930.40
		TL= 74.36	S15°00'12"W		
PC	8+26.66			266115.14	2444911.15
PI	8+64.99	R= 80.28	DELTA= 54°42'28.80" L	266074.43	2444902.91
PT	9+03.32			266044.18	2444931.37
		TL=81.37	S55°55'02"E		
POE	9+84.70			265998.58	2444998.76

CONTROL POINTS

POINT	STATION	OFFSET	DESCRIPTION	NORTHING	EASTING	ELEVATION
CP 1	5+22	27.28' L	IP EAST OF BRIDGE	266421.625	2444921.370	1257.235
CP 2	6+16	19.60' R	IP SE OF BRIDGE	266317.984	2444908.188	1256.766
CP 3	1+55	23.23' L	IP NORTH OF ROAD	266385.514	2444671.576	1255.036
CP 4	-1+38	88.10' R	IP SW OF ROAD	266195.930	2444422.800	1258.739

THE COORDINATES SHOWN ON THE SHEET ARE BASED ON THE SOUTH DAKOTA STATE PLANE COORDINATE SYSTEM. SOUTH ZONE (NAD 83); GEOID 12B;

HORIZONTAL ALIGNMENT DATA

FOR

103'-0" DECK BULB TEE GIRDER BRIDGE

29'- 10" ROADWAY — 0° SKEW

OVER RANDALL CREEK — SEC. 17-T095N-R65W

STR. NO. 27498312 — HL-93

RANDALL CREEK RESTORATION AREA

SOUTH DAKOTA DEPARTMENT OF GAME, FISH, & PARKS

OCTOBER 2019

DESIGNED BY	CK. DES. BY	DRAFTED BY	
ZJH	DRB	ZJH	BRIDGE ENGINEER

LEGEND

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	RanC20Pa	9	30

- Anchor
- Antenna
- Approach
- Assumed Corner
- Azimuth Marker
- BBQ Grill/ Fireplace
- Bearing Tree
- Bench Mark
- Box Culvert
- Bridge
- Brush
- Buildings
- Bulk Tank
- Cattle Guard
- Cemetery
- Centerline
- Cistern
- Clothes Line
- Commercial Sign Double Face
- Commercial Sign One Post
- Commercial Sign Overhead
- Commercial Sign Two Post
- Concrete Symbol
- Control Point
- Creek Edge
- Curb/Gutter
- Curb
- Dam Grade/Dike/Levee
- Deck Edge
- Ditch Block
- Doorway Threshold
- Drainage Profile
- Drop Inlet
- Edge Of Asphalt
- Edge Of Concrete
- Edge Of Gravel
- Edge Of Other
- Edge Of Shoulder
- Electric Transformer/Power Junction Box
- Fence Barbwire
- Fence Chainlink
- Fence Electric
- Fence Miscellaneous
- Fence Rock
- Fence Snow
- Fence Wood
- Fence Woven
- Fire Hydrant
- Flag Pole
- Flower Bed
- Gas Valve Or Meter
- Gas Pump Island
- Grain Bin
- Guardrail
- Guide Sign One Post
- Guide Sign Two Post
- Gutter
- Guy Pole
- Haystack
- Hedge
- Highway ROW Marker
- Interstate Close Gate
- Iron Pin
- Irrigation Ditch
- Lake Edge
- Lawn Sprinkler
- Mailbox
- Manhole Electric
- Manhole Gas
- Manhole Miscellaneous
- Manhole Sanitary Sewer
- Manhole Storm Sewer
- Manhole Telephone
- Manhole Water
- Merry-Go-Round
- Microwave Radio Tower
- Miscellaneous Line
- Miscellaneous Property Corner
- Miscellaneous Post
- Overhang Or Encroachment
- Overhead Utility Line — OH —
- Parking Meter
- Pedestrian Push Button Pole
- Pipe With End Section
- Pipe With Headwall
- Pipe Without End Section
- Playground Slide
- Playground Swing
- Power And Light Pole
- Power And Telephone Pole
- Power Meter
- Power Pole
- Power Pole And Transformer
- Power Tower Structure
- Propane Tank
- Property Pipe
- Property Pipe With Cap
- Property Stone
- Public Telephone
- Railroad Crossing Signal
- Railroad Milepost Marker
- Railroad Profile
- Railroad ROW Marker
- Railroad Signs
- Railroad Switch
- Railroad Track
- Railroad Trestle
- Rebar
- Rebar With Cap
- Reference Mark
- Regulatory Sign One Post
- Regulatory Sign Two Post
- Retaining Wall
- Riprap
- River Edge
- Rock And Wire Baskets
- Rockpiles
- Satellite Dish
- Septic Tank
- Shrub Tree
- Sidewalk
- Sign Face
- Sign Post
- Slough Or Marsh
- Spring
- Stream Gauge
- Street Marker
- Subsurface Utility Exploration Test Hole
- Telephone Fiber Optics — T/F —
- Telephone Junction Box
- Telephone Pole
- Television Cable Jct Box
- Television Tower
- Test Wells/Bore Holes
- Traffic Signal
- Trash Barrel
- Tree Belt
- Tree Coniferous
- Tree Deciduous
- Tree Stumps
- Triangulation Station
- Underground Electric Line — P —
- Underground Gas Line — G —
- Underground High Pressure Gas Line — HG —
- Underground Sanitary Sewer — S —
- Underground Storm Sewer — S —
- Underground Tank
- Underground Telephone Line — T —
- Underground Television Cable — TV —
- Underground Water Line — W —
- Warning Sign One Post
- Warning Sign Two Post
- Water Fountain
- Water Hydrant
- Water Meter
- Water Tower
- Water Valve
- Water Well
- Weir Rock
- Windmill
- Wingwall
- Witness Corner

- State and National Line
- County Line
- Section Line
- Quarter Line
- Sixteenth Line
- Property Line
- Construction Line
- ROW Line
- New ROW Line
- Cut and Fill Limits
- Control of Access
- New Control of Access
- Proposed ROW (After Property Disposal)

- Drainage Arrow

- Remove Concrete Pavement
- Remove Concrete Driveway Pavement
- Remove Asphalt Concrete Pavement
- Remove Concrete Sidewalk
- Remove Concrete Median Pavement
- Remove Concrete Curb and/or Gutter

- Detectable Warning Pedestrian Push Button Pole and 30" x 48" Clear Space with 1.5% slope

LEGEND SHEET

FOR

103'-0" DECK BULB TEE GIRDER BRIDGE

RANDALL CREEK RESTORATION AREA

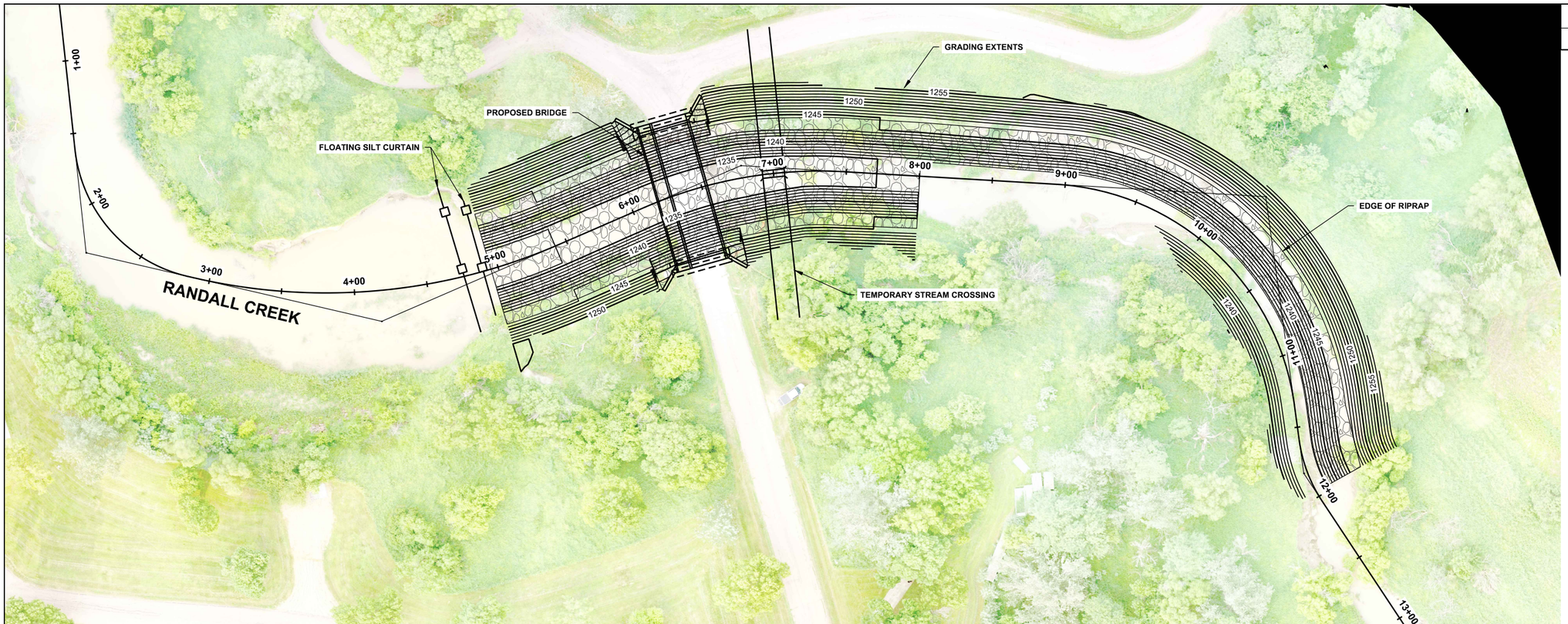
SOUTH DAKOTA DEPARTMENT OF GAME, FISH, & PARKS

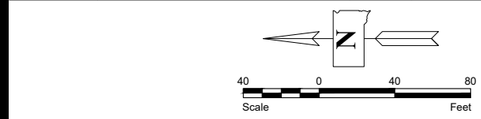
OCTOBER 2019

STR. NO. 27498312

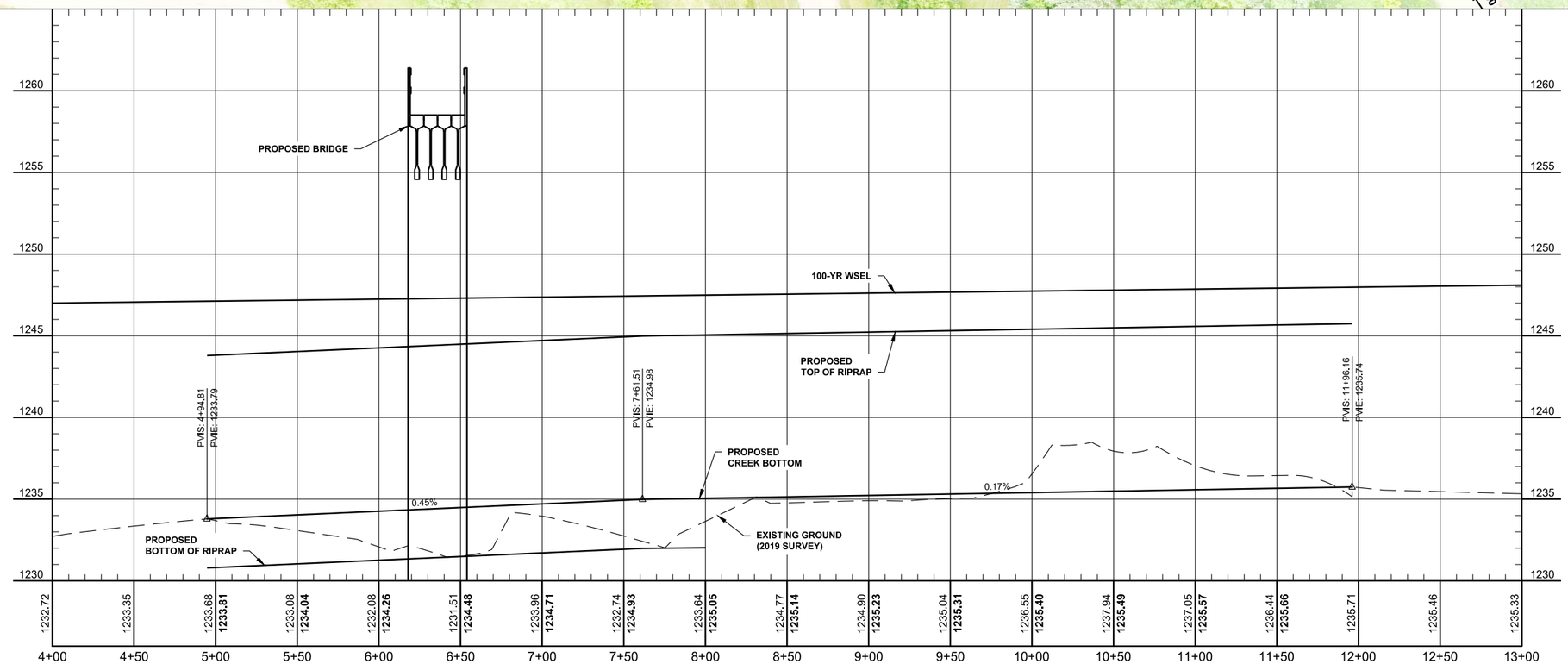
DESIGNED BY	CK. DES. BY	DRAFTED BY	
ZJH	DRB	ZJH	BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	RanC20Pa	10	30





FLOATING SILT CURTAIN



CREEK RESTORATION PLAN & PROFILE

FOR

103'-0" DECK BULB TEE GIRDER BRIDGE

29'- 10" ROADWAY — 0° SKEW

OVER RANDALL CREEK — SEC. 17-T095N-R65W

STR. NO. 27498312 — HL-93

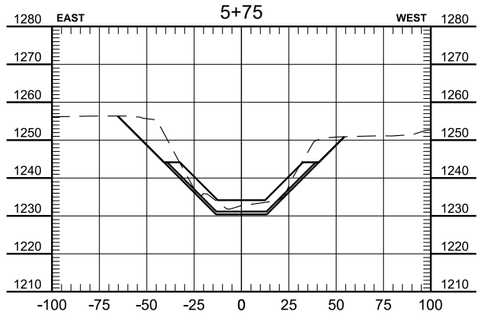
RANDALL CREEK RESTORATION AREA

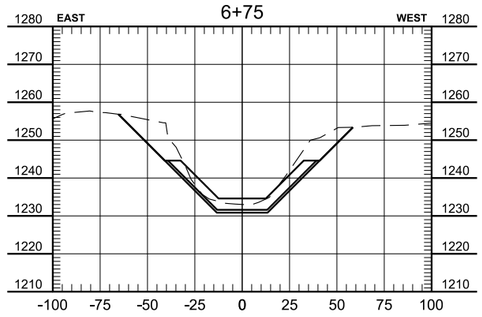
SOUTH DAKOTA DEPARTMENT OF GAME, FISH, & PARKS

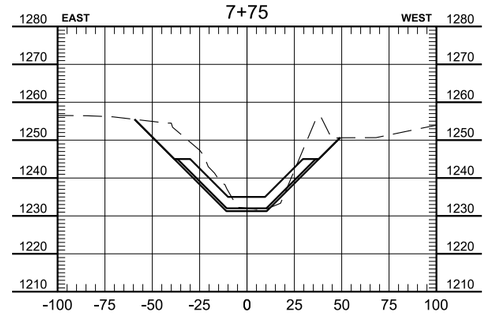
OCTOBER 2019

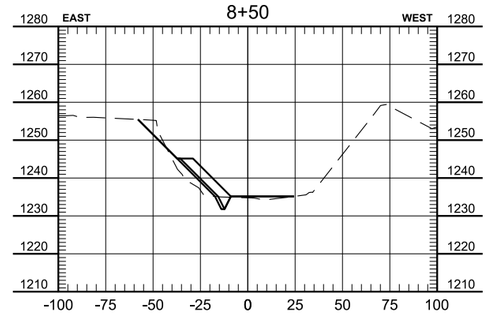
DESIGNED BY	CK. DES. BY	DRAFTED BY	
JKH	RGE	JKH	BRIDGE ENGINEER

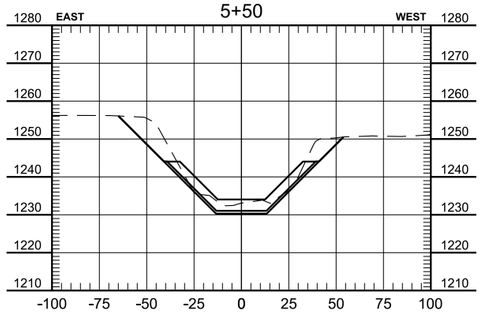
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	RanC20Pa	11	30

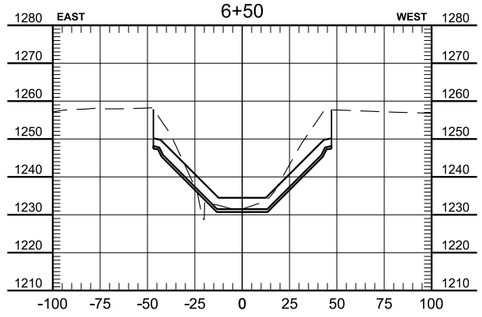


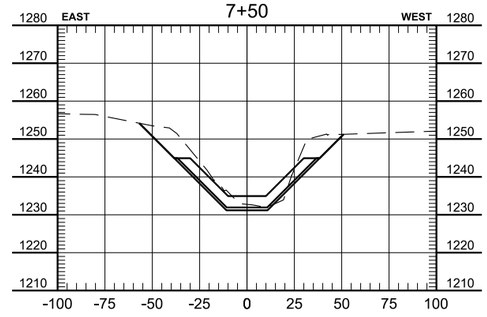


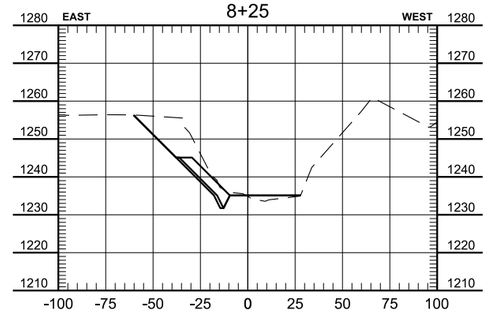


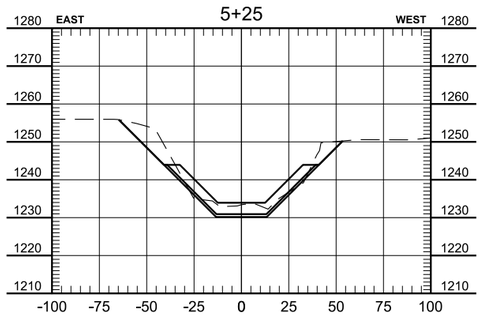


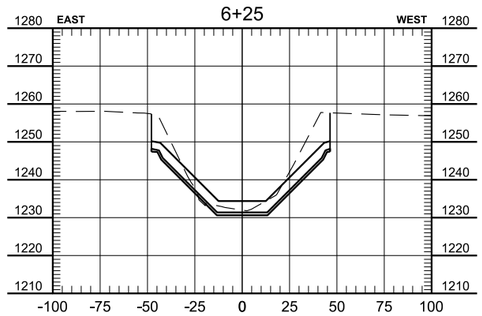


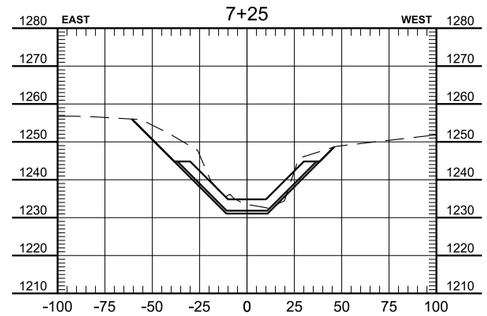


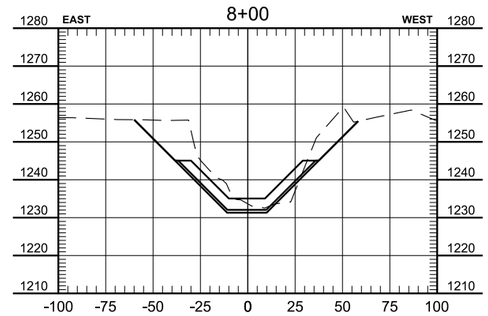


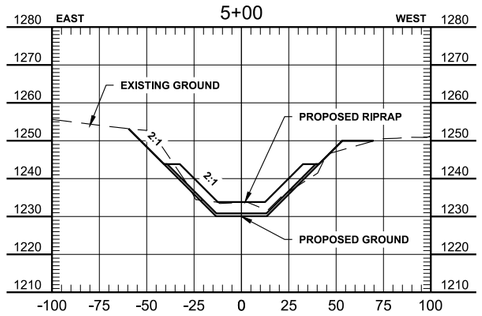


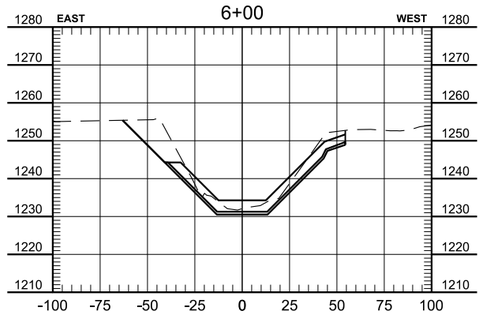


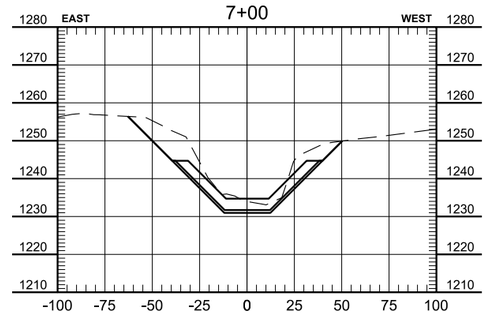












CREEK RESTORATION CROSS SECTIONS

FOR

103'-0" DECK BULB TEE GIRDER BRIDGE

29'- 10" ROADWAY — 0° SKEW

OVER RANDALL CREEK — SEC. 17-T095N-R65W

STR. NO. 27498312 — HL-93

RANDALL CREEK RESTORATION AREA

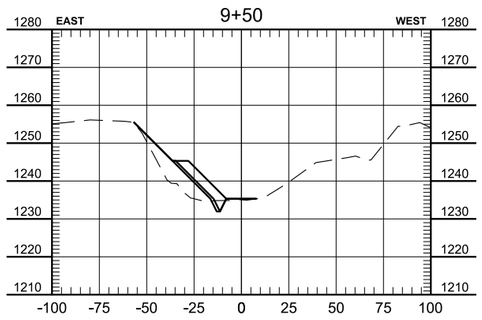
SOUTH DAKOTA DEPARTMENT OF GAME, FISH, & PARKS

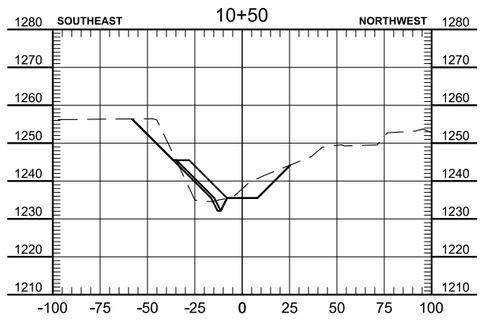
OCTOBER 2019

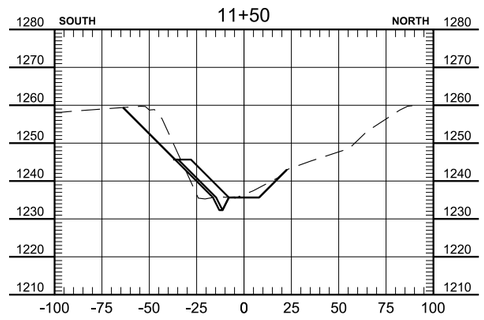
2 OF 4

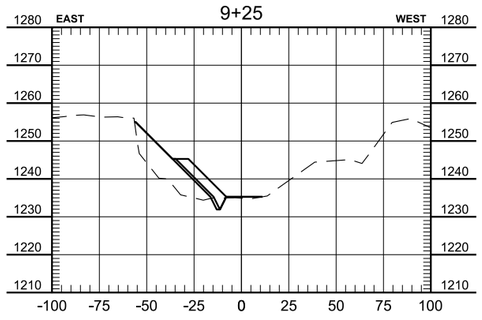
DESIGNED BY	CK. DES. BY	DRAFTED BY	
JKH	RGE	JKH	BRIDGE ENGINEER

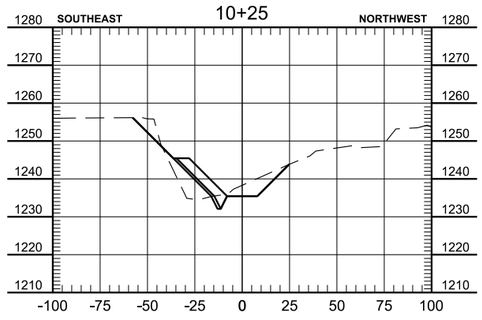
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	RanC20Pa	12	30

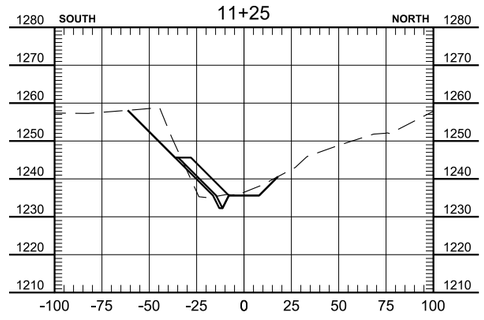


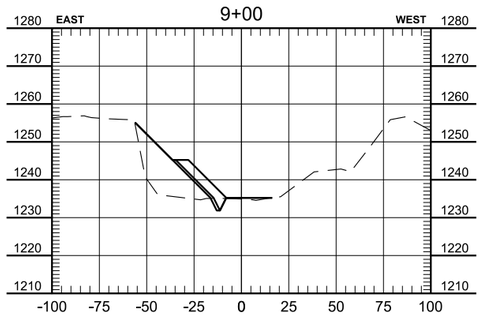


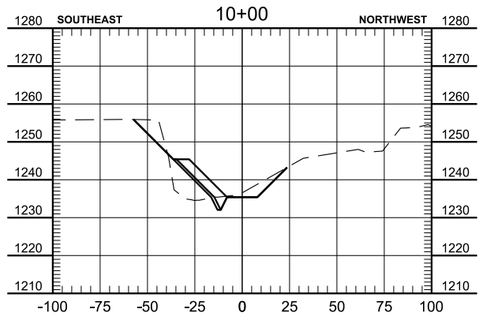


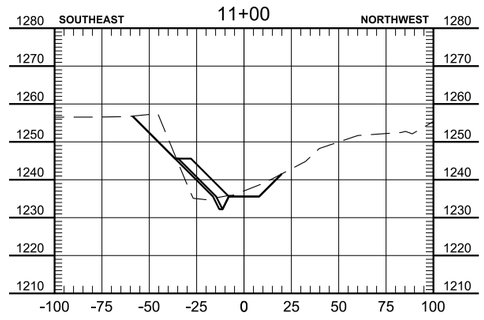


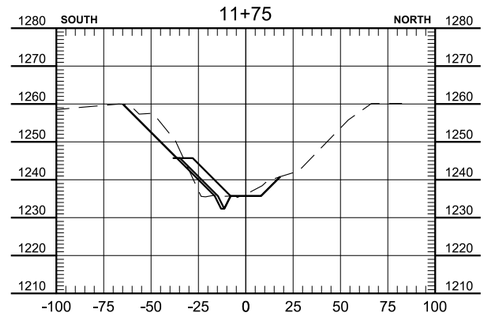


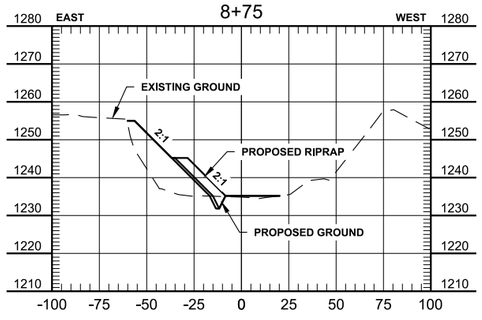


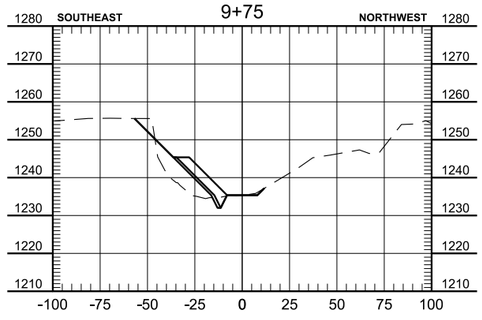


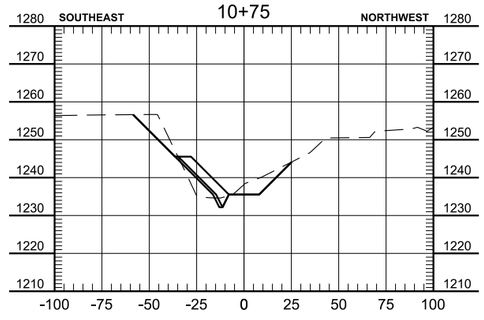












CREEK RESTORATION CROSS SECTIONS

FOR

103'-0" DECK BULB TEE GIRDER BRIDGE

29'- 10" ROADWAY — 0° SKEW

OVER RANDALL CREEK — SEC. 17-T095N-R65W

STR. NO. 27498312 — HL-93

RANDALL CREEK RESTORATION AREA

SOUTH DAKOTA DEPARTMENT OF GAME, FISH, & PARKS

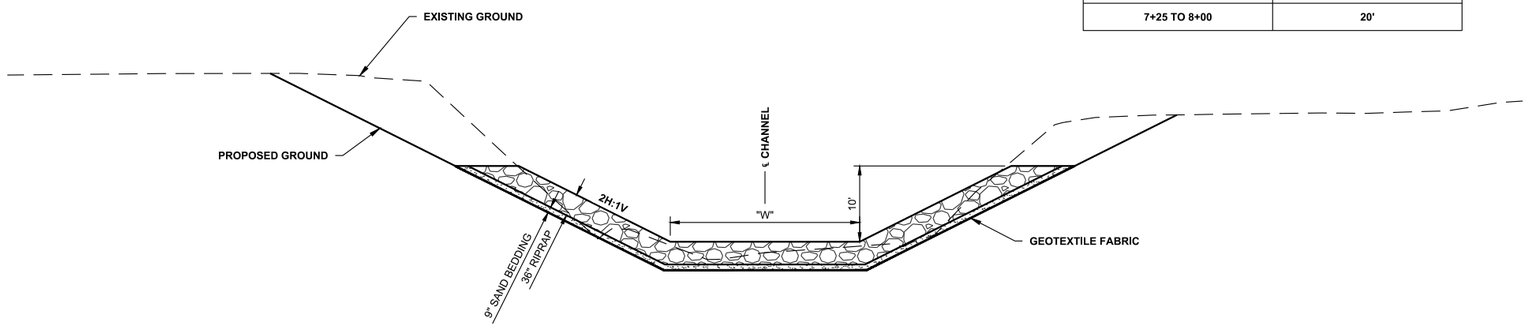
OCTOBER 2019

3 OF 4

DESIGNED BY	CK. DES. BY	DRAFTED BY	
JKH	RGE	JKH	BRIDGE ENGINEER

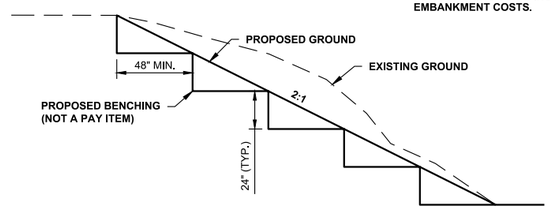
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	RanC20Pa	13	30

CHANNEL BOTTOM WIDTH	
STATION	**"W"**
4+95 TO 5+97	25'
6+70 TO 7+25	VARIES (25' TO 20')
7+25 TO 8+00	20'

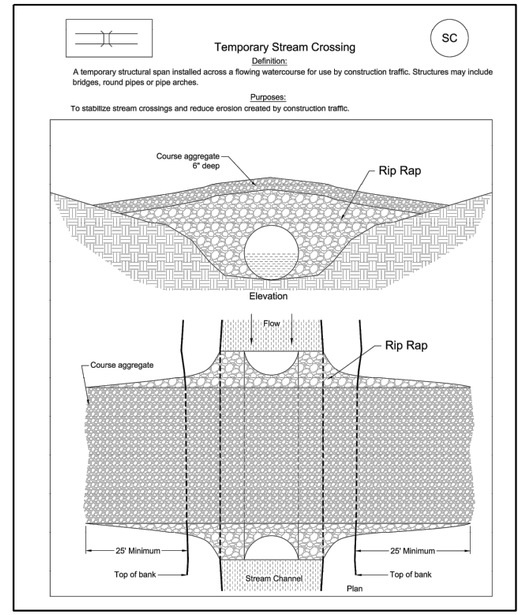


1 – SECTION: FULL CHANNEL REHABILITATION
STA 4+95 TO STA 6+07
STA 6+70 TO STA 8+00

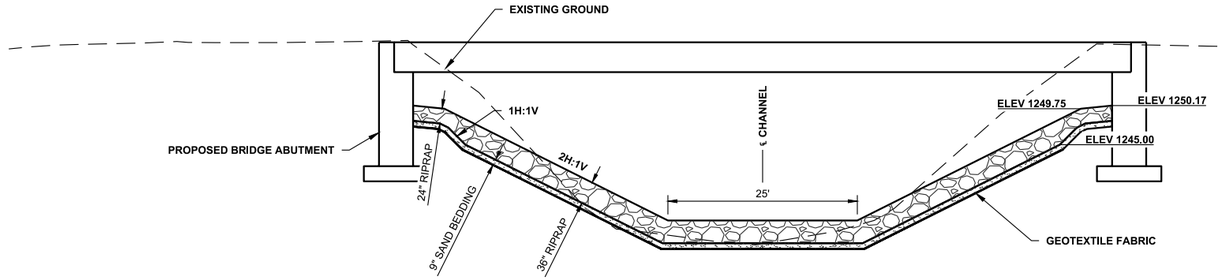
NOTE:
BENCHING SHALL BE REQUIRED. THE BACK OF THE BENCH SHALL BE NEARLY VERTICAL, WITH THE HORIZONTAL CUTS BEING MADE AS THE SLOPE PERMITS AT A 2:1 SLOPE. COST FOR BENCHING TO BE INCLUDED IN EMBANKMENT COSTS.



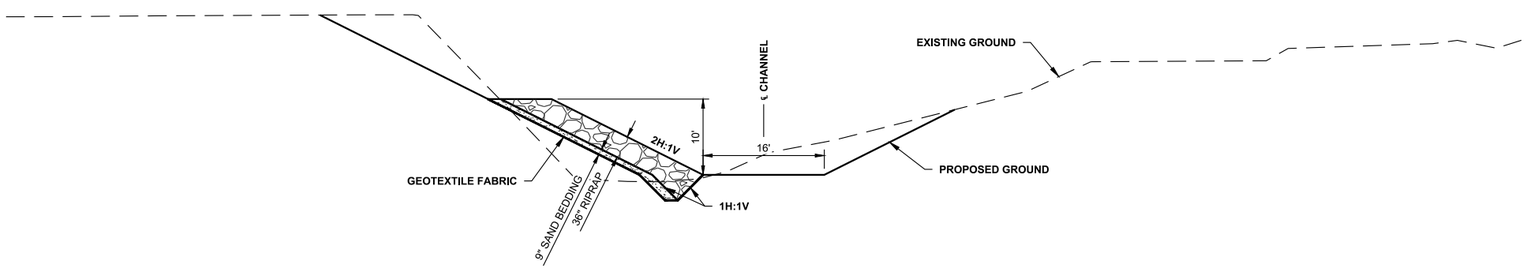
TYPICAL SLOPE BENCHING
NOT TO SCALE



TYPICAL TEMPORARY STREAM CROSSING
NOT TO SCALE



2 – SECTION: FULL CHANNEL REHABILITATION UNDER BRIDGE
STA 6+07 TO STA 6+70



3 – SECTION: FULL CHANNEL REHABILITATION
STA 8+00 TO 11+96

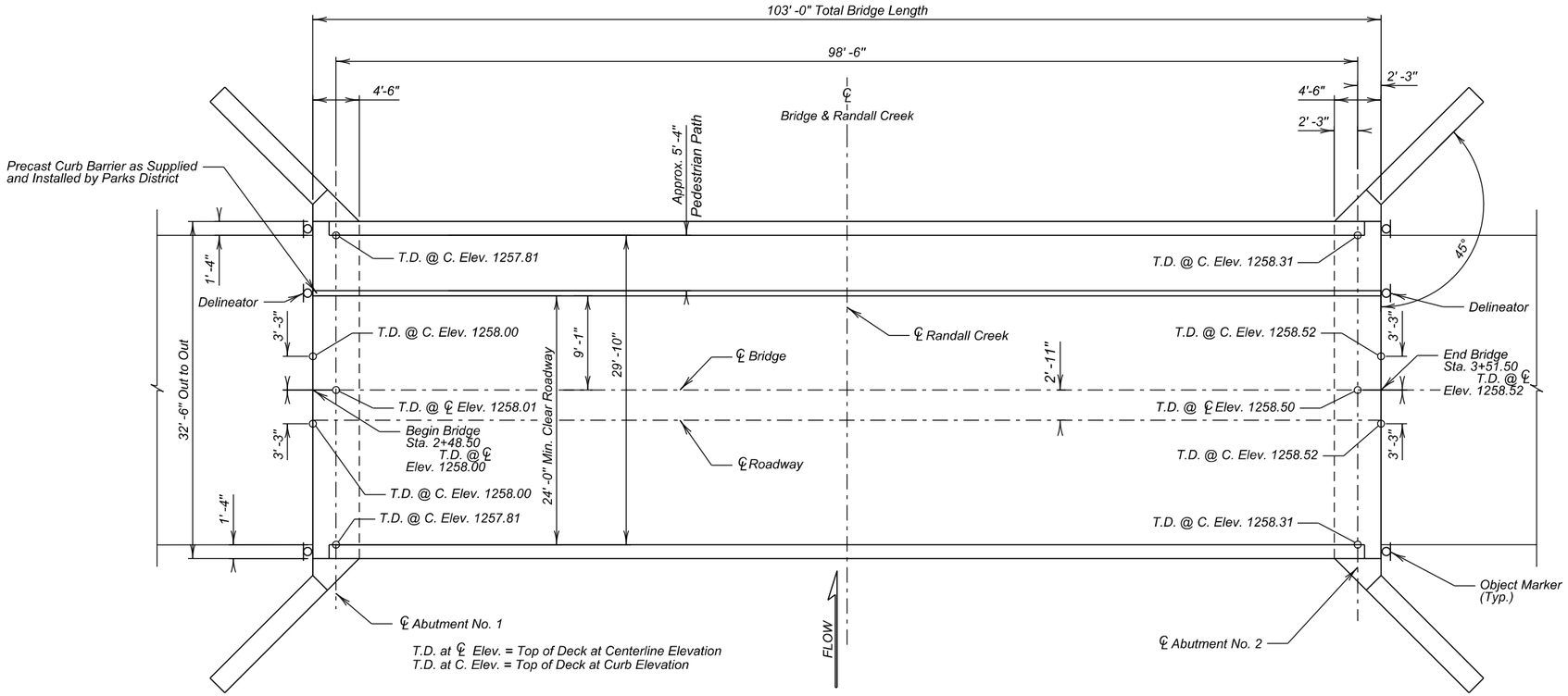
CREEK RESTORATION TYPICAL SECTIONS
FOR
103'-0" DECK BULB TEE GIRDER BRIDGE
29'- 10" ROADWAY — 0° SKEW
OVER RANDALL CREEK — SEC. 17-T095N-R65W
STR. NO. 27498312 — HL-93

RANDALL CREEK RESTORATION AREA
SOUTH DAKOTA DEPARTMENT OF GAME, FISH, & PARKS
OCTOBER 2019

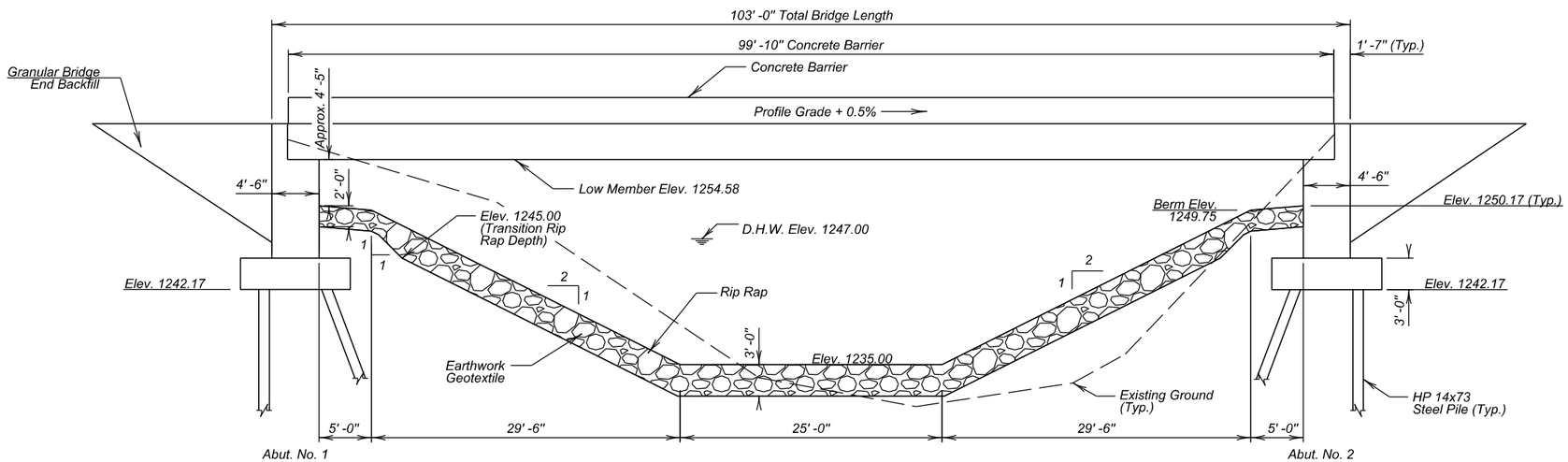
4 OF 4

DESIGNED BY	CK. DES. BY	DRAFTED BY	
JKH	RGE	JKH	BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	RanC20Pa	14	30

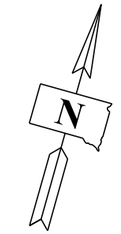


PLAN



ELEVATION

INDEX OF SHEETS -



GENERAL DRAWING

FOR

103'-0" DECK BULB TEE GIRDER BRIDGE

29'- 10" ROADWAY — 0° SKEW

OVER RANDALL CREEK — SEC. 17-T095N-R65W

STR. NO. 27498312 — HL-93

RANDALL CREEK RESTORATION AREA

SOUTH DAKOTA DEPARTMENT OF GAME, FISH, & PARKS

OCTOBER 2019

Plans by:
Houston Engineering
Sioux Falls, SD

DESIGNED BY	CK. DES. BY	DRAFTED BY	
LJB	JLM	AJK	BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	RanC20Pa	15	30

ESTIMATE OF STRUCTURE QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
250E0030	Incidental Work, Structure	1	LS
410E0030	Structural Steel, Miscellaneous	1	LS
420E0030	Structure Excavation, Bridge	1875	CuYd
430E0200	Bridge End Embankment	758	CuYd
430E0300	Granular Bridge End Backfill	256	CuYd
430E0700	Precast Concrete Headw all for Drain	2	Each
460E0060	Class A45 Concrete, Bridge	281.3	CuYd
460E0030	Class A45 Concrete, Bridge Deck	35	CuYd
470E0040	Steel Pedestrian Railing	100	Ft
480E0100	Reinforcing Steel	20440	Lb
480E0200	Epoxy Coated Reinforcing Steel	5710	Lb
510E3521	HP 14x73 Steel Test Pile, Furnish and Drive	210	Ft
510E3521	HP 14x73 Steel Bearing Pile, Furnish and Drive	2600	Ft
680E0040	4" Underdrain Pipe	151	Ft
680E2500	Porous Backfill	22	Ton
560E8560	6.5' Wide Deck Prestress Concrete Bulb Tee	500	Ft

SPECIFICATIONS FOR BRIDGE

1. Design Specifications: AASHTO LRFD Bridge Design Specifications, 2017 Edition.

2. Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, 2015 Edition and required provisions, supplemental specifications, and special provisions as included in the proposal.

BRIDGE DESIGN LOADING

1. AASHTO HL-93.

2. Dead Load includes 22 psf for future wearing surface on the roadway.

DESIGN MATERIAL STRENGTHS*

Concrete	f'c = 4,500 psi
Reinforcing Steel	fy = 60,000 psi
Piling (ASTM A572 Grade 50)	fy = 50,000 psi

*For prestressed beams, see notes regarding Prestressed Girders.

GENERAL CONSTRUCTION

1. All mild reinforcing steel shall conform to ASTM A615, Grade 60.

2. All lap splices shown are contact lap splices unless noted otherwise.

3. All exposed concrete corners and edges shall be chamfered 3/4" unless noted otherwise.

4. Use 2" clear cover on all reinforcing steel except as shown.

5. Contractor shall imprint on the structure the date of new construction as specified and detailed on Standard Plate No. 460.02.

6. Barrier Curbs and End blocks shall be built normal to the grade.

7. Request for construction joints or resteel splices at points other than those shown, must be submitted to the Engineer for prior approval. If additional splices are approved, no payment will be allowed for the added quantity of resteel.

8. Due to construction timelines of this project, Cold Weather Concreting will likely be encountered. Precautions shall be taken in accordance with the South Dakota Standard Specifications for Roads and Bridges, 2015 Edition.

INCIDENTAL WORK, STRUCTURE

1. In place centerline Sta. 2+59.16 to centerline Sta. 3+34.16 of existing bridge. The superstructure consists of precast double tee's with a concrete curbs and steel beam guardrail with chainlink fence. The substructure consists of 5 column timber bents and timber vertical abutments, most of which are supported by shallow timber piling. Bent #2 & #3 are supported on concrete filled CMP piling.

2. Break down and remove the existing bridge to 1 foot below finished groundline, or as required to construct the new structure in accordance with Section 110 of the Specifications. All portions of the existing bridge shall be removed and disposed of by the Contractor on a site obtained by the Contractor and approved by the Engineer in accordance with the WASTE DISPOSAL NOTES found elsewhere in these plans.

3. During demolition of the structure, efforts shall be taken to prevent material from falling into the creek. Under no circumstances is asphalt allowed to fall into the creek.

4. The foregoing is a general description of the in-place bridge and should not be construed to be complete in all details. Before preparing the bid it shall be the responsibility of the Contractor to make a visual inspection of the structure to verify the extent of the work and materials involved. If desired by the Contractor, a copy of the original construction plans may be obtained through the SD Parks Department.

DESIGN MIX OF CONCRETE

1. All structural concrete shall be Class A45 unless otherwise indicated.

2. Type II cement is required, except Type III may be used for the prestressed beams.

3. Grout design mix shall be as specified in Section 460.2 K of the Specifications. A compressive strength of 2000 psi shall be attained by the grout prior to erection of any beams. Chamfer edges of grout pads ¾". The quantity of grout is included in and shall be paid for at the contract unit price per cubic yard for Class A45 Concrete, Bridge.

ABUTMENTS

1. The HP 14x73 Piling were designed using a factored bearing resistance of 134 tons per pile. Piling shall develop a field verified nominal bearing resistance of 335 tons per pile.

2. One test pile shall be driven at each abutment and will become part of the pile group.

3. The contractor shall have sufficient pile splice material on hand before pile driving is started. See Standard Plate No. 510.40.

4. Piles shall not be driven out of position by more than three inches in the direction normal to the abutment centerline. A pile-driving template shall be used to insure this accuracy.

5. The concrete used for the abutment diaphragms, and wings shall be Class A45 Concrete, Bridge. All abutment concrete shall have attained design strength prior to backfilling.

6. Each finished abutment shall include a Bridge Survey Marker. See Standard Plate No. 460.05.

ESTIMATE OF STRUCTURE QUANTIES AND NOTES
FOR
103'-0" DECK BULB TEE GIRDER BRIDGE

Str. No. 27498312

OCTOBER 2019 (2) (13)

DESIGNED BY:	CK. DES.BY:	DRAWN BY::	
LJB	JLM	SMH	BRIDGE ENGINEER

ABUTMENT BACKWALL COATING

The material for waterproofing the abutment backwall shall be one of the products from the approved products list. The acceptable abutment backwall coating suppliers are listed on the approved products list at the following Internet address:

http://apps.sd.gov/applications/HC60ApprovedProducts/ProductList.aspx

The cost of furnishing and applying the coating shall be incidental to the contract unit price per cubic yard for Class A45 Concrete, Bridge.

PILE DRIVING

1. A drivability analysis is required to be performed using the wave equation analysis program (GRLWEAP). The driving system must be submitted to the engineer for approval 10 business days prior to use for any pile driving activities. All costs associated with the drivability analysis and submitted shall be included in the bid price for HP 14x73 Steel Test Pile, Furnish and Drive.

PRE-CAST PRESTRESSED BULB TEE DECK UNITS

1. Precast Prestressed Bulb Tee deck units shall be 41” deep and 6’-6” wide. The manufacturer shall submit shop drawings prepared and signed by an engineer registered in the state of South Dakota. Shop drawings shall include strand draping diaphragm barrier reinforcement as shown in drawings, and sleeve spacing. Deck units shall be designed for AASHTO HL-93 live load and a future 22 pounds per square foot overlay.
2. Minimum concrete compressive strength f’c = 7000 psi at 28 days for all girders, f’ci = 6000 psi for all girders.
3. All mild reinforcing steel shall be deformed bars conforming to ASTM A615, Grade 60.
4. Individual tendons in all pretensioned sections shall consist of seven wire uncoated Type 270K Strands having a nominal diameter of 0.6” and a minimum ultimate strength of 58600 lbs. per cable.
5. All prestressed girders shall be cast within an 8 day period. If not, the newest girder shall be at least 6 weeks old prior to placement. The girders shall be poured in all steel forms.
6. Prestressed concrete girders shall always be lifted by the devices provided in the top flanges near the ends of the girders. Types of lifting devices other than those shown on the plans may be used provided they are approved by the Engineer. The design of the lifting devices shall be the responsibility of the Fabricator.
7. Each beam shall be marked showing structure number, casting date, and beam number. Marking shall be on the face of the beam near the end and so located that they will be exposed after the diaphragms have been cast. Facia beams shall be marked on an inside face. All markings shall be stenciled and clearly legible. For beam designations and locations, see superstructure layout plan and Erection Data sheet.
8. All exposed corners shall be chamfered 3/4” or rounded to 3/4” radius.
9. Dead Load of girder taken as effective at transfer. Cut strands, except those extended and bent, flush with end of girder and coat end of strands with mortar.
10. The Contractor shall be responsible for ensuring that transportation stresses, handling and erection do not cause damage to the girders.

SUPERSTRUCTURE

1. Girder lifting hooks shall be cut and grouted over.
2. Snap ties, if used in the barrier curb formwork, shall be epoxy coated. The epoxy coating shall be inert in concrete and compatible with the coating applied to the new epoxy coated reinforcing steel

BOLT TESTING

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

SHOP PLANS

The fabricator shall submit shop plans in accordance with the Specifications. Send shop plan submittals to Houston Engineering Inc., 3800 W Technology Circle, Suite 6, Sioux Falls, SD, 57106 (lbeckermann@houstoneng.com) for approval.

FALL PROTECTION

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

CLASS B COMMERCIAL TEXTURE FINISH

1. A Class B commercial texture finish shall be applied to the following areas:
   a. **Barrier Rail:** all exposed surfaces (front, top and back).
2. The Class B commercial texture finish shall be applied in accordance with Section 460.3 L.1.c of the Specifications.
3. Where the Class B commercial texture finish is to be applied, concrete curing shall be accomplished with cotton or burlap mats and polyethylene sheeting. Curing shall continue for not less than seven days after placing concrete before the commercial texture finish is applied. The commercial texture finish shall be applied in accordance with the manufacturer’s recommendations. The commercial texture finish itself does not require a specific cure except for drying.
4. The cost of the Class B Commercial Texture Finish applied to the fascia girders shall be incidental to the contract unit price per cubic yard for Class A45 Concrete, Bridge Deck.

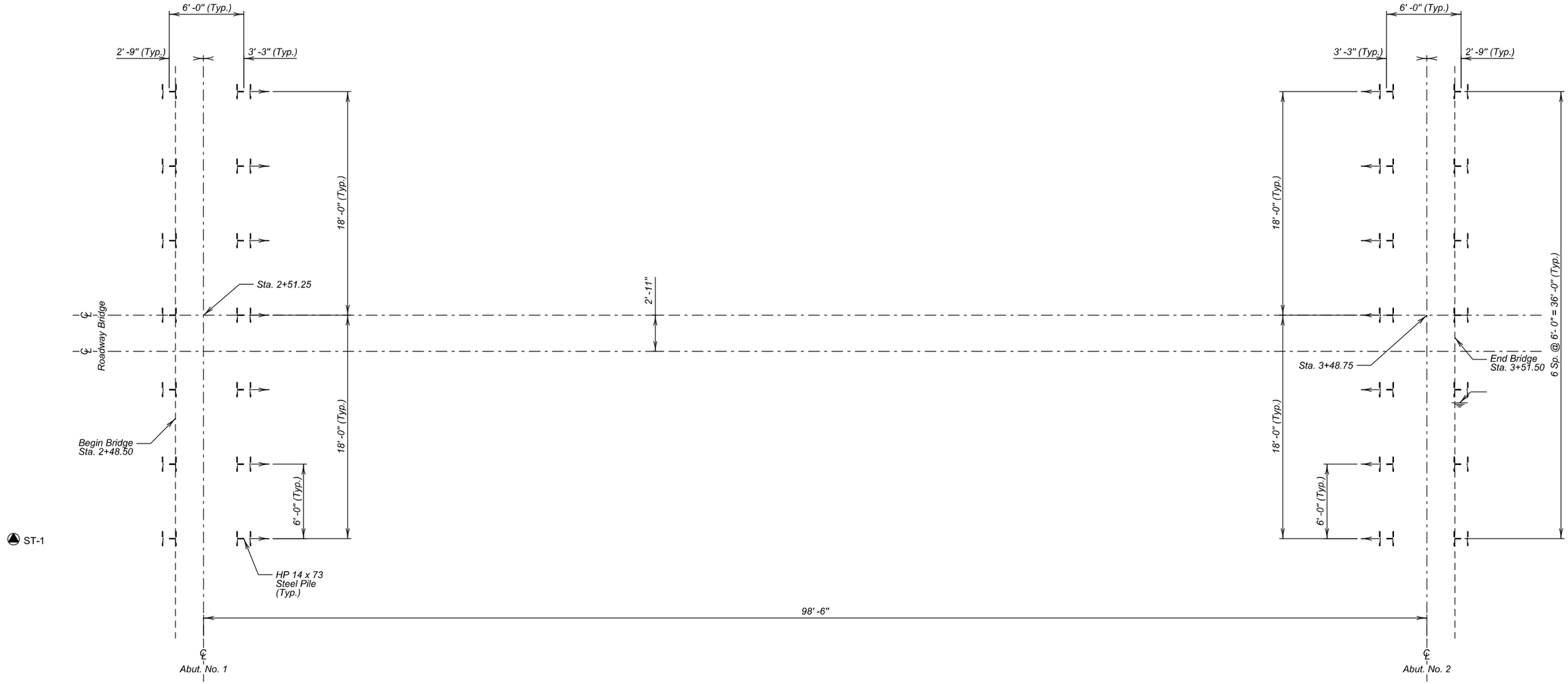
NOTES (CONTINUED)
FOR
103’-0” DECK BULB TEE GIRDER BRIDGE

Str. No. 27498312

OCTOBER 2019 (3) (13)

DESIGNED BY:	CK. DES. BY:	DRAWN BY:	
LJB	JLM	SMH	BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	RanC20Pa	17	30



The Geotechnical Evaluation Report, Project 32-20294, provided by American Engineering Testing, Inc. contains all boring logs and additional information. If desired by the contractor, a copy of the geotechnical report may be obtained through Houston Engineering Inc.

Notes:

1. *Piles marked with ⊢→ to be battered in the direction shown at 3H:12V.*

LEGEND

▲ Drive Test

N

PILING LAYOUT

FOR

103'-0" DECK BULB TEE GIRDER BRIDGE

29'- 10" ROADWAY — 0° SKEW

OVER RANDALL CREEK — SEC. 17-T095N-R65W

STR. NO. 27498312 — IM xxx

RANDALL CREEK RESTORATION AREA

SOUTH DAKOTA DEPARTMENT OF GAME, FISH, & PARKS

OCTOBER 2019

4 OF 13

DESIGNED BY	CK. DES. BY	DRAFTED BY	
LJB	JLM	AJK	BRIDGE ENGINEER

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: **32-20294** LOG OF BORING NO. **1 (p. 1 of 3)**

PROJECT: **Bridge Replacement, Randall Creek; Randall Creek Recreation Area**

SURFACE ELEVATION: **98.7'**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	qu
1–3	FILL, 5" of ASPHALT over 4" of CLAYEY SAND, with a little gravel then FAT CLAY and LEAN CLAY, black, dark brown and brown, wet to very moist, lenses of sand	FILL	2	M	SS	10					
			3	M	SS	10					
4–5				M	3T						
6–8			6	M	SS	16					
9–11				M	3T		28	91	43	23	2100
12–14			4	M	SS	16					
15–16			3	M	SS	16	43				
17–18			7	M	SS	18					
19–21			8	M ▼	SS	18					
22–24											
25–27	FAT CLAY, grayish brown, very moist to moist, firm to stiff, lenses of waterbearing sand (CH)	FINE ALLUVIUM	6	M	SS	12	39				
28–30			7	M	SS	18	50				
31–35			10	M	SS	12					
36–39	SAND, fine to medium grained, with a little gravel, grayish brown, waterbearing, loose (SP)	COARSE ALLUVIUM									

DEPTH: DRILLING METHOD	WATER LEVEL MEASUREMENTS						
	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL
0-124.6' 3.25" HSA	**6/19/19**	**10:44**	**14'**	**10'**	**14'**		**None**
	6/20/19	**10:07**	**106'**	**7'**	**104'**		**20'**
BORING COMPLETED: **6/20/19**							
DR: **RH** LG: **MH** Rig: **63**							

NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG

06/04

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: **32-20294** LOG OF BORING NO. **1 (p. 2 of 3)**

PROJECT: **Bridge Replacement, Randall Creek; Randall Creek Recreation Area**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	qu
41–43	SAND, fine to medium grained, with a little gravel, grayish brown, waterbearing, loose (SP) *(continued)*	COARSE ALLUVIUM *(continued)*	7	M	SS	16					
44–47	SILTY SAND, fine grained, grayish brown, waterbearing, medium dense (SM)	MIXED ALLUVIUM	14	M	SS	12					
48–49	SAND, fine to medium grained, with a little gravel, grayish brown, waterbearing, medium dense to dense (SP)	COARSE ALLUVIUM									
50–54			19	M	SS	17					
55–59			37	M	SS	17					
60–63	SILTY SAND, fine to medium grained, grayish brown, waterbearing, loose to medium dense to dense to medium dense, lenses of fat clay, some coal seams (SM)	MIXED ALLUVIUM	7	M	SS	18					
64–68			23	M	SS	18					
69–72			20	M	SS	10					
73–76			17	M	SS	16					
77–81			39	M	SS	18					
82–87			20	M	SS	18					

06/04

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: **32-20294** LOG OF BORING NO. **1 (p. 3 of 3)**

PROJECT: **Bridge Replacement, Randall Creek; Randall Creek Recreation Area**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	qu
88–93	SILTY SAND, fine to medium grained, grayish brown, waterbearing, loose to medium dense to dense to medium dense, lenses of fat clay, some coal seams (SM) *(continued)*	MIXED ALLUVIUM *(continued)*	15	M	SS	18					
94–98	FAT CLAY, gray, moist, very stiff (CH)	FINE ALLUVIUM	17	M	SS	16	49				
99–107	SAND, fine to medium grained, with a little gravel, gray, waterbearing, medium dense (SP)	COARSE ALLUVIUM	22	M	SS	18					
			29	M	SS	18					
108–113	SILTY CLAY, very moist, firm (CL-ML)	FINE ALLUVIUM	5	M	SS	18	32				
114–119	NIOBRARA MARL, Textural Classification: (FAT CLAY, grayish brown, moist to very moist, hard (CH))	NIOBRARA MARL	53/.1	M	SS		44				
120–123			54/.2	M	NSR						
124	**OBSTRUCTION AT 124.6'**			M	NSR						

06/04

SUBSURFACE INVESTIGATION
FOR
103'-0" DECK BULB TEE GIRDER BRIDGE

29'-10" ROADWAY
OVER RANDALL CREEK
STR. NO. 27498312

0° SKEW
SEC. 17-T095N-R65W
HL-93

RANDALL CREEK RESTORATION AREA
SOUTH DAKOTA DEPARTMENT OF GAME, FISH, & PARKS
OCTOBER 2019

DESIGNED BY	CK. DES. BY	DRAFTED BY	
LJB	JLM	SMH	BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	RanC20Pa	19	30

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: **32-20294** LOG OF BORING NO. **2 (p. 1 of 1)**

PROJECT: **Bridge Replacement, Randall Creek; Randall Creek Recreation Area**

SURFACE ELEVATION: **90.0'**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS: WC	DEN	LL	PL	qu
1	LEAN CLAY, brown, very moist (CL-OL)	TOPSOIL		M							
2	LEAN CLAY, brown, very moist (CL)	FINE ALLUVIUM									
3				M							
4	FAT CLAY, brown mottled, very moist (CH)										
5											
6				M							
7	**END OF BORING**										
	Bag sample obtained from 1'-7'.										

DEPTH: DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-7' 6" FA	**6/20/19**						**None**	
BORING COMPLETED: **6/20/19**								
DR: **RH** LG: **MH** Rig: **63**								

06/04

SUBSURFACE INVESTIGATION
FOR
103'-0" DECK BULB TEE GIRDER BRIDGE

29'-10" ROADWAY
OVER RANDALL CREEK
STR. NO. 27498312

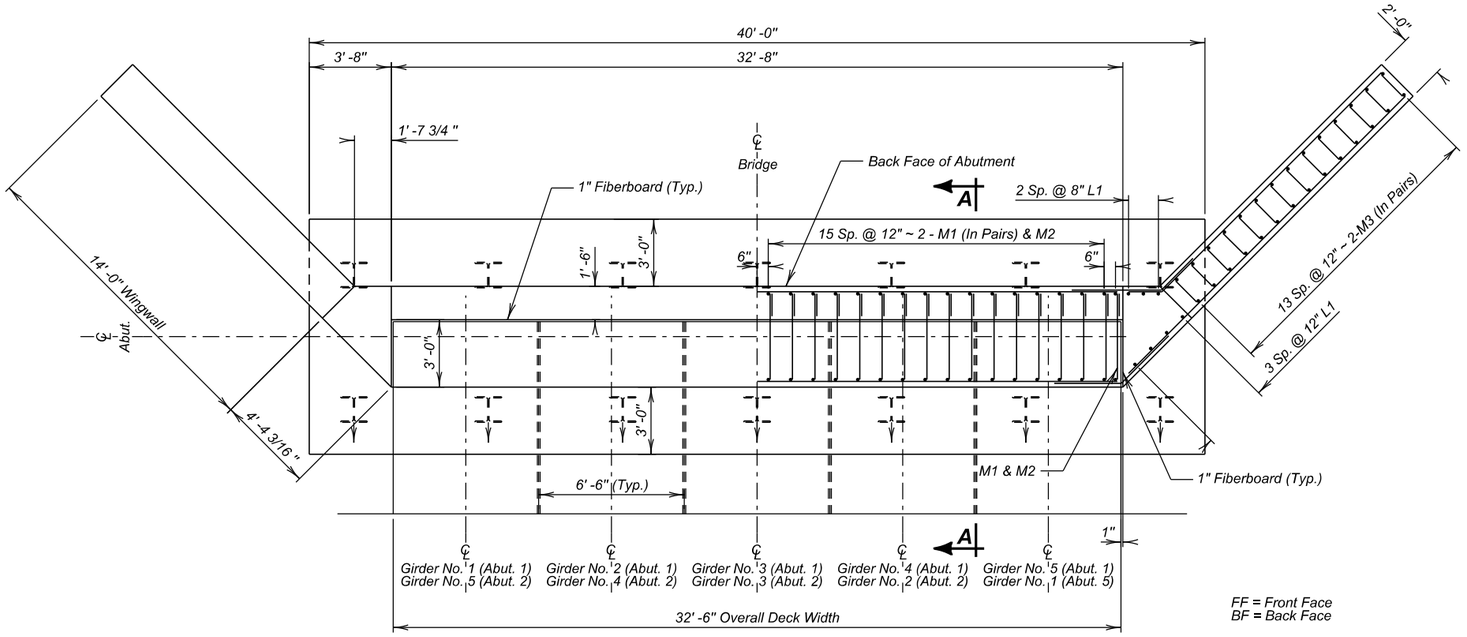
0° SKEW
SEC. 17-T095N-R65W
HL-93

RANDALL CREEK RESTORATION AREA
SOUTH DAKOTA DEPARTMENT OF GAME, FISH, & PARKS
OCTOBER 2019

6 OF 13

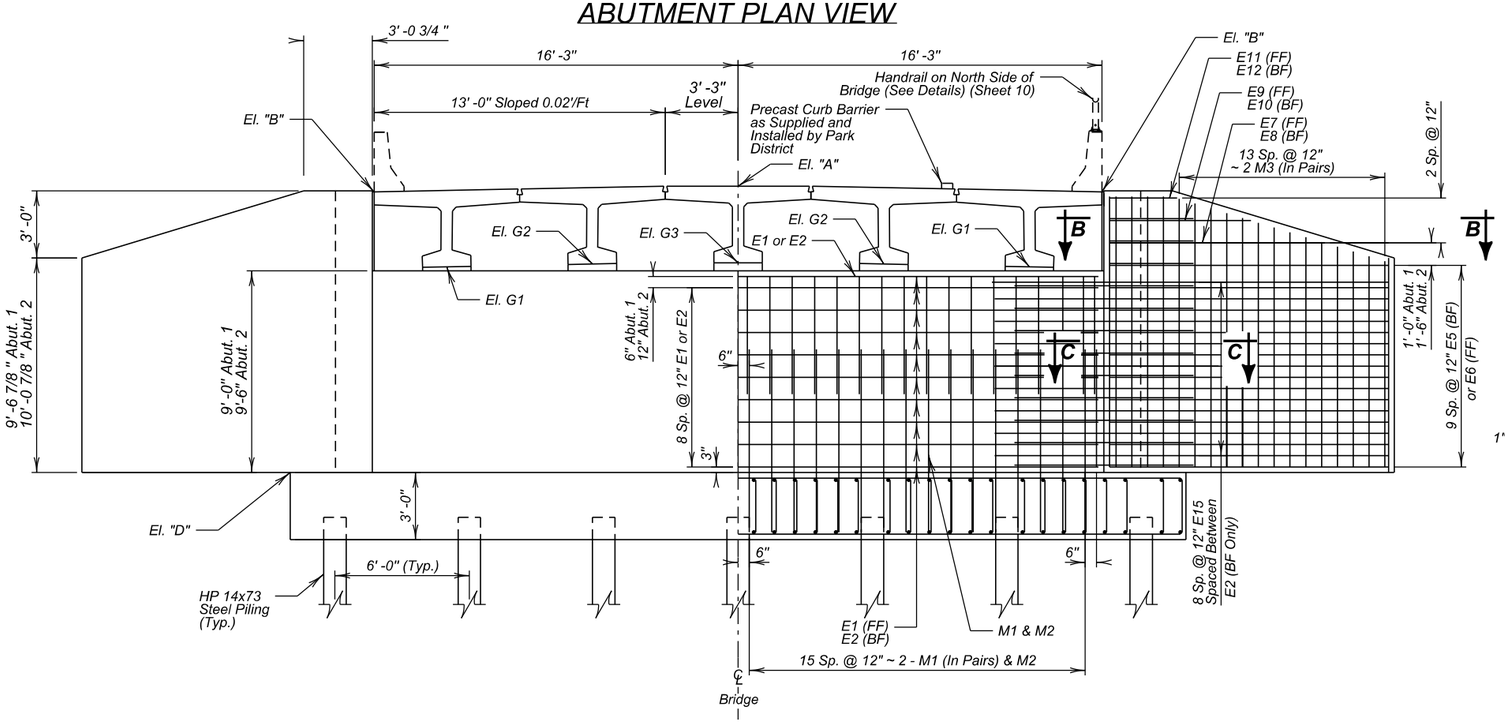
DESIGNED BY	CK. DES. BY	DRAFTED BY	
LJB	JLM	SMH	BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	RanC20Pa	20	30



FF = Front Face
BF = Back Face

ABUTMENT PLAN VIEW



ABUTMENT ELEVATION VIEW

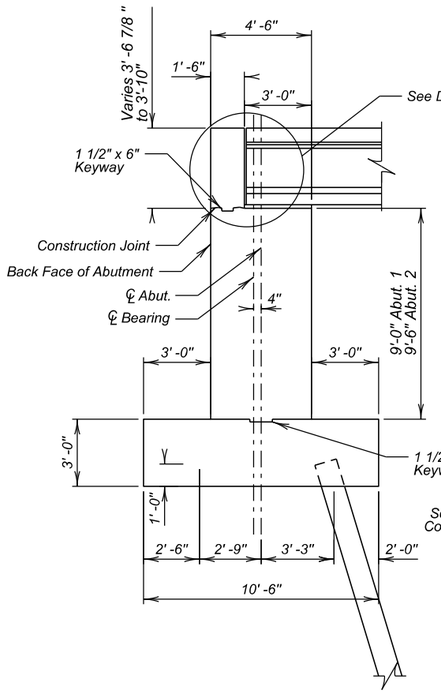
✠TABLE OF ELEVATIONS

Abutment	Elev. "A"	Elev. "B"	Elev. G1	Elev. G2	Elev. G3	Elev. D
No. 1	1258.00	1257.74	1254.35	1254.48	1254.54	1245.17
No. 2	1258.50	1258.24	1254.85	1254.98	1255.04	1245.17

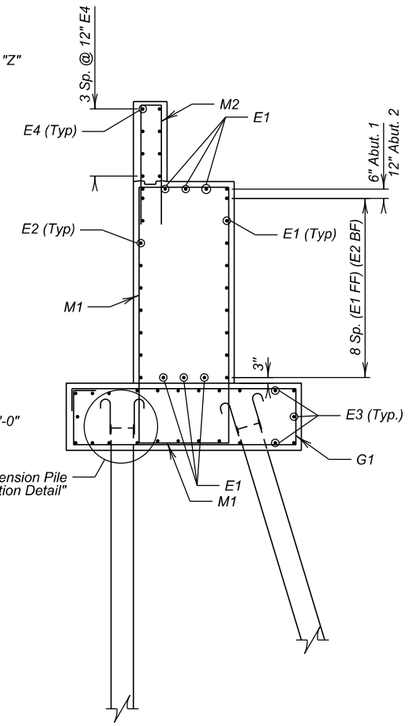
✠ NOTES:

Elevations "A", "B" and "C" are top of slab at the outside edge of abutments. Elevations "G1" thru "G3" are at the top of grout pad at the centerline of the abutment. The grout pad at the center of the abutment G3 is to be constructed level. The remaining grout pads are to be constructed to match the crown slope of 0.02'/Ft.

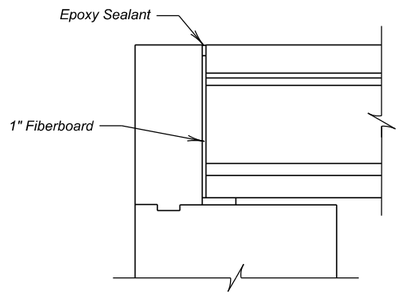
The approximate tip elevation of the piling end for Abutment No. 1 is 1143 and for Abutment No. 2 is 1143.



SECTION A-A



SECTION A-A REINFORCING



DETAIL Z

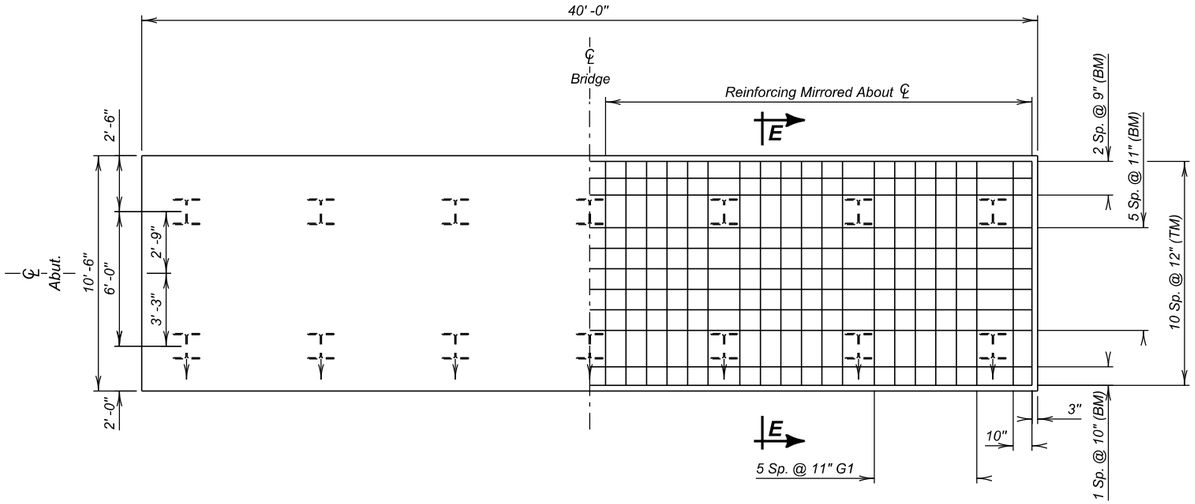
ABUTMENT DETAILS
FOR
103'-0" DECK BULB TEE GIRDER BRIDGE

29'- 10" ROADWAY — 0° SKEW
OVER RANDALL CREEK — SEC. 17-T095N-R65W
STR. NO. 27498312 — HL-93

RANDALL CREEK RESTORATION AREA
SOUTH DAKOTA DEPARTMENT OF GAME, FISH, & PARKS
OCTOBER 2019

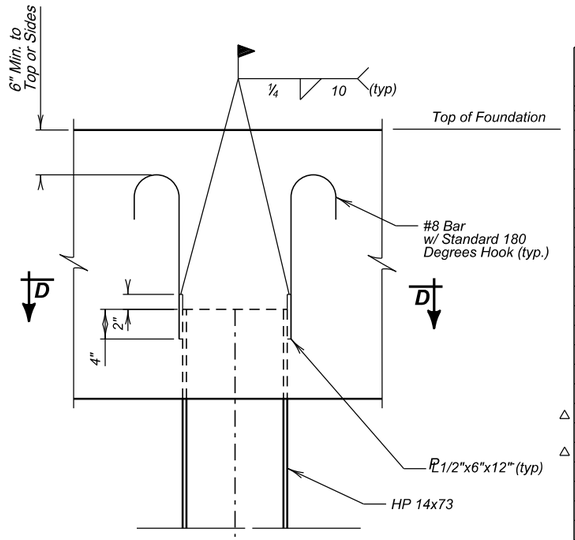
DESIGNED BY	CK. DES. BY	DRAFTED BY	
LJB	JLM	AJK	BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	RanC20Pa	21	30



FOOTING PLAN VIEW
(Bottom Mat Shown)

BM = Bottom Mat
TM = Top Mat

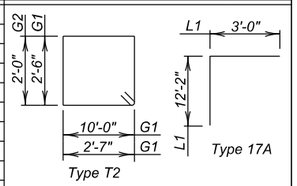


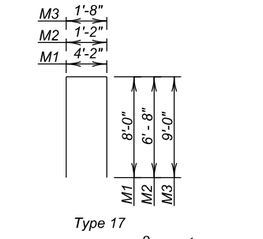
TENSION PILE CONNECTION DETAIL

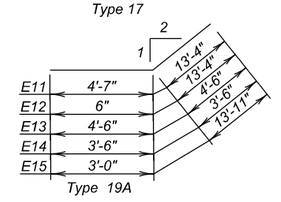
REINFORCING SCHEDULE
(for One Abutment)

Mk.	No.	Size	Length	Type
E1	16	5	32'-4"	Str.
E2	10	6	36'-0"	Str.
E3	24	5	39'-8"	Str.
E4	8	5	32'-4"	Str.
E5	20	6	13'-9"	Str.
E6	20	6	17'-10"	Str.
E7	2	5	14'-0"	Str.
E8	2	5	9'-11"	Str.
E9	2	5	9'-4"	Str.
E10	2	5	5'-3"	Str.
E11	2	5	17'-11"	19A
E12	2	5	13'-10"	19A
E13	28	6	9'-0"	19A
E14	28	6	7'-0"	19A
E15	18	6	16'-11"	19A
△ E16	6	5	32'-2"	Str.
G1	40	5	26'-4"	T2
△ G2	26	5	10' - 4"	T2
L1	14	6	15'-2"	17A
M1	68	6	20'-2"	17
M2	34	5	14'-6"	17
M3	56	6	19'-8"	17

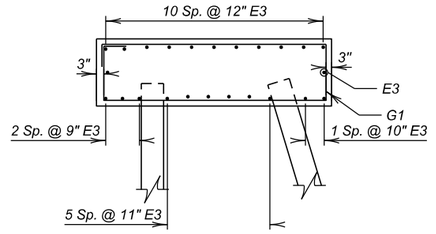
Bending Details



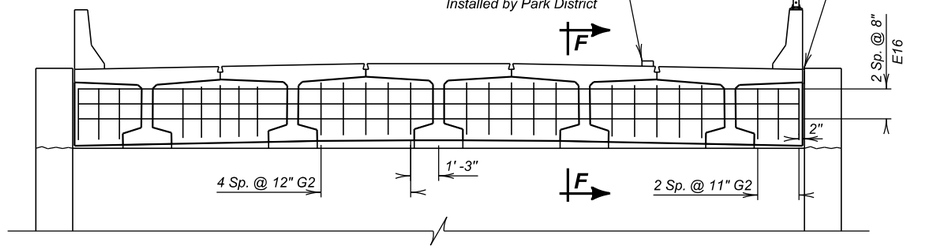




NOTES:
All dimensions are out to out of bars.
△ Bars to be Epoxy Coated.



SECTION E-E

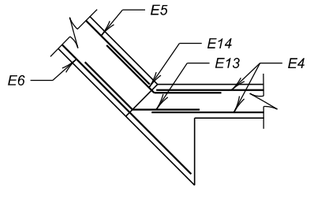


DIAPHRAGM DETAIL

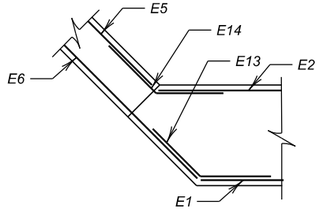
ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY Abut. No. 1	QUANTITY Abut. No. 2
⏍ Class A45 Concrete, Bridge	Cu. Yd.	148.6	152.6
Reinforcing Steel	Lb.	10220	10220
Epoxy Coated Reinforcing Steel	Lb.	490	490
Structure Excavation, Bridge	Cu. Yd.	937.5	937.5
HP 14 X 73 Steel Test Pile, Furnish and Drive	Ft.	1 @ 105' = 105'	1 @ 105' = 105'
HP 14 X 73 Steel Bearing Pile, Furnish and Drive	Ft.	13 @ 100' = 1300'	13 @ 100' = 1300'

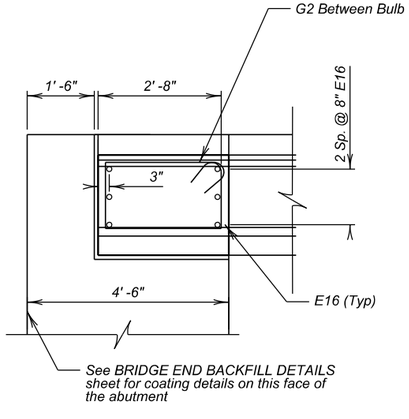
⏍ Includes 0.1 Cu.Yd. for grout pads, and concrete for diaphragms.



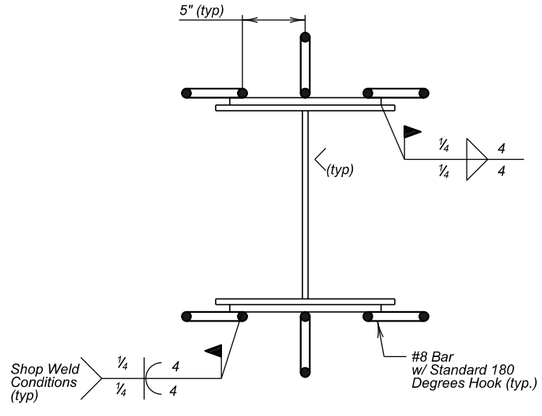
SECTION B-B



SECTION C-C



SECTION F-F



SECTION D-D

ABUTMENT DETAILS
FOR
103'-0" DECK BULB TEE GIRDER BRIDGE
29'- 10" ROADWAY — 0° SKEW
OVER RANDALL CREEK — SEC. 17-T095N-R65W
STR. NO. 27498312 — HL-93

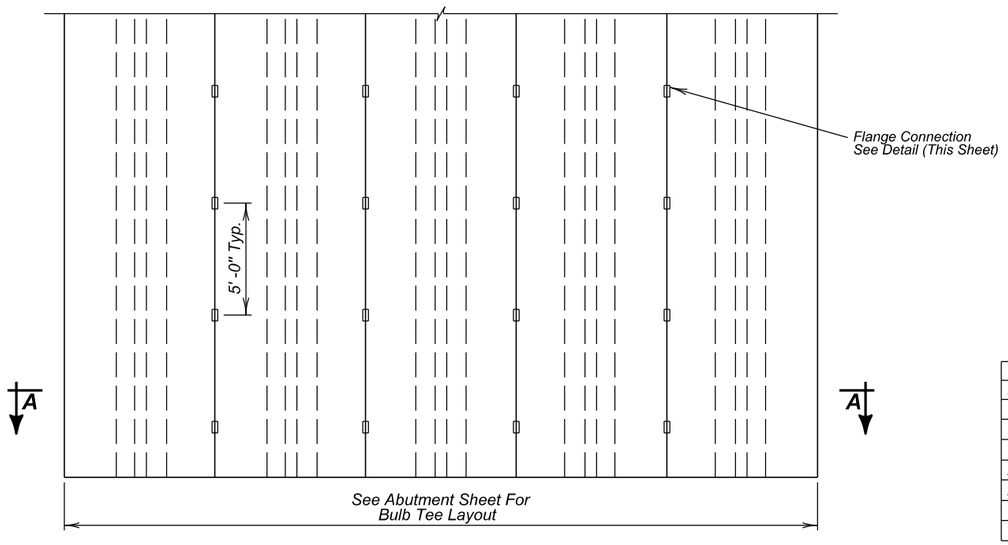
RANDALL CREEK RESTORATION AREA
SOUTH DAKOTA DEPARTMENT OF GAME, FISH, & PARKS
OCTOBER 2019

DESIGNED BY	CK. DES. BY	DRAFTED BY	
LJB	JLM	AJK	BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	RanC20Pa	22	30

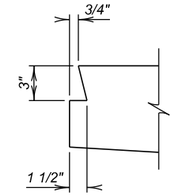
Erection Note

Prestressed precast bulb tee deck units shall be cabled together at each end and braced until all weld tabs have been installed.

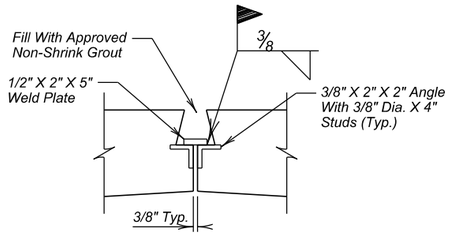


PLAN VIEW

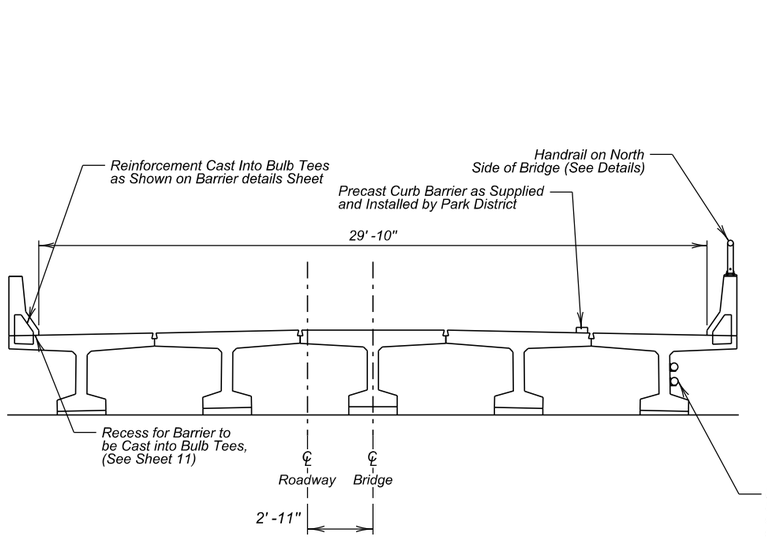
SECTION DESIGNATION	30-6.5
HEIGHT (in.)	41
WIDTH (ft.)	6.5
SECTION AREA (in2.)	980
I (in4.)	174734
Zb (in3.)	6472
Zt (in3.)	13441
C.G. FROM BOTTOM	27.0
WEIGHT/FOOT (lbs.)	1034



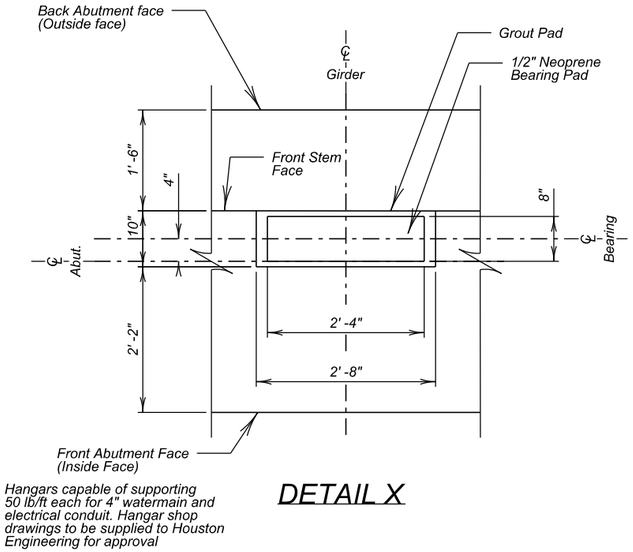
KEYWAY DETAIL



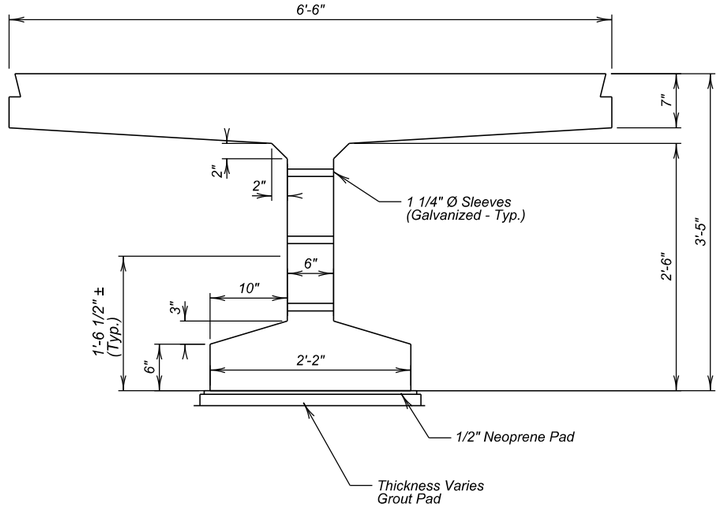
CONNECTION DETAIL



SECTION A-A



DETAIL X



DETAIL Y

Bulb Tee Notes

Prestressed precast bulb tee deck units shall be designed by the manufacturer and stamped and signed by an engineer registered in the state of South Dakota. Design shall include:

Live Load HL-93 AASHTO, + 22 PSF future allowance
Dynamic load allowance: 33%
100 lb/ft supported by North Bulb Tee for utilities
Concrete bridge railing as shown in plans (340 lb/ft of rail)
L= span length shown on general drawing

Manufacturer shall furnish shop drawings which show:

Design calculations
Strand draping
Concrete bridge railing reinforcement placement
Sleeve placement for diaphragms and abutment reinforcing
Fabrication & inspection specification: In accordance with manufacturer's Recomendation and standard practice

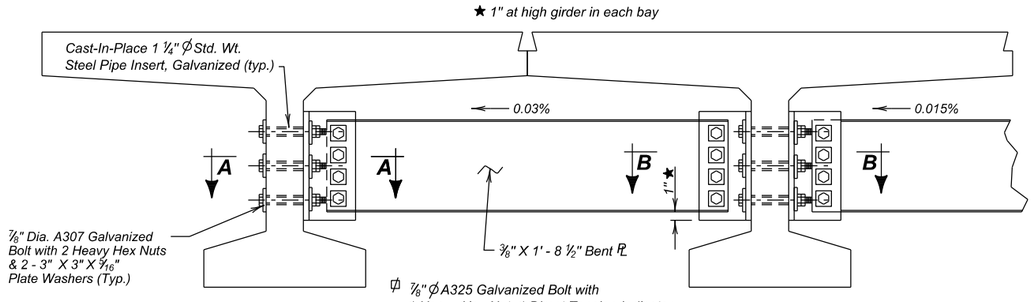
GIRDER DETAILS
FOR
103'-0" DECK BULB TEE GIRDER BRIDGE

29'- 10" ROADWAY — 0° SKEW
OVER RANDALL CREEK — SEC. 17-T095N-R65W
STR. NO. 27498312 — HL-93

RANDALL CREEK RESTORATION AREA
SOUTH DAKOTA DEPARTMENT OF GAME, FISH, & PARKS
OCTOBER 2019

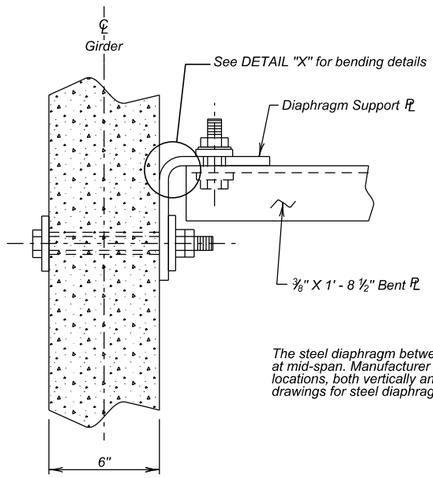
DESIGNED BY	CK. DES. BY	DRAFTED BY	
LJB	JLM	AJK	BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	RanC20Pa	23	30



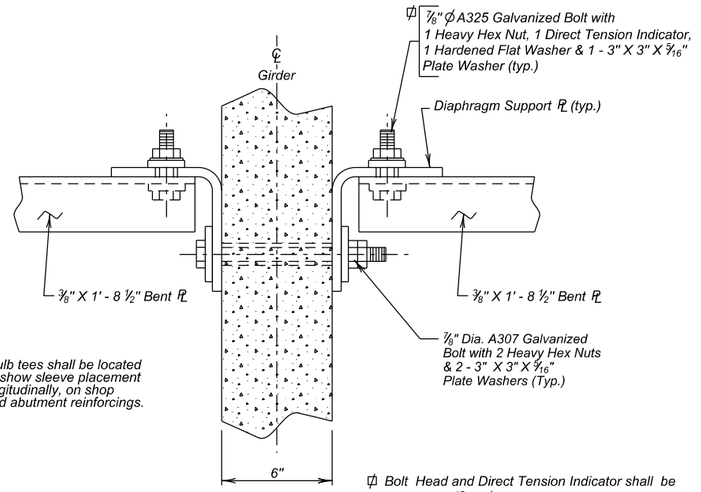
Bolt Head and Direct Tension Indicator shall be adjacent to $^{15}/_{16}$" Ø holes in Bent Plate Diaphragm.

SECTION AT DIAPHRAGM



SEC. A - A

The steel diaphragm between bulb tees shall be located at mid-span. Manufacturer shall show sleeve placement locations, both vertically and longitudinally, on shop drawings for steel diaphragm and abutment reinforcings.



Bolt Head and Direct Tension Indicator shall be adjacent to $^{15}/_{16}$" Ø holes in Bent Plate Diaphragm.

SEC. B - B

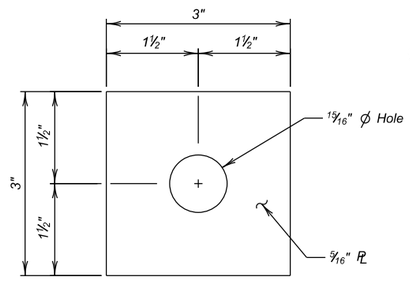
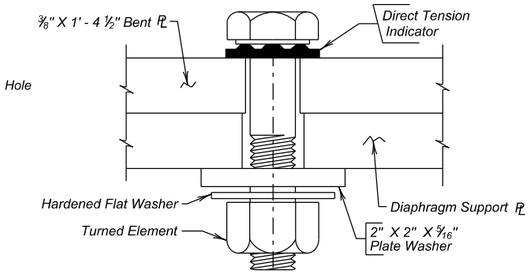
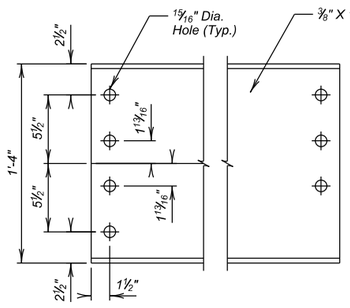


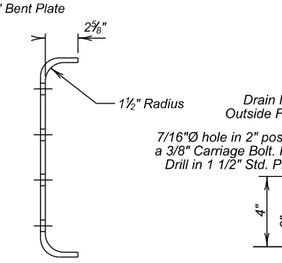
PLATE WASHER DETAILS



DIRECT TENSION INDICATOR DETAIL

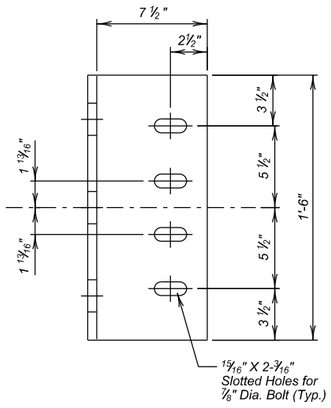


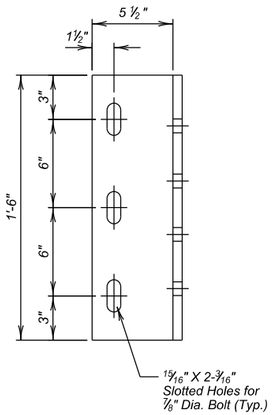
BENT PLATE DIAPHRAGM



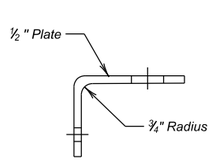
END VIEW

BARRIER RAIL ANCHOR DETAIL

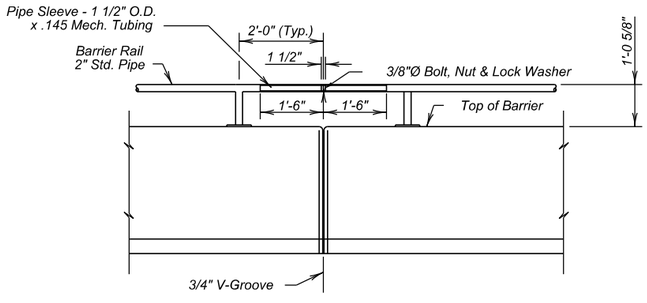




DIAPHRAGM SUPPORT PLATE



DETAIL "X"



BARRIER V-GROVE DETAIL

NOTES:

1. All steel for the diaphragms including plate washers shall conform to ASTM A36 and shall be galvanized in accordance with ASTM A123 or A153. Bolts, nuts, and washers shall be galvanized in accordance with ASTM F2329. Direct Tension Indicators shall conform to Section 410 of the Specifications.
2. The steel diaphragms between adjacent girders shall be installed as soon as possible and in conjunction with girder erection.
3. All costs associated with furnishing, fabricating, assembly and installation of diaphragms shall be included in the lump sum price for Structural Steel, Miscellaneous.
4. All rail to be galvanized
5. All costs associated with funishing, fabricating, and installation of rail shall be included in the per foot price for steel pdestrian railing.

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY
△ Structural Steel, Miscellaneous	L.S.	Lump Sum

△ For informational purposes only, the estimated weight of structural steel is 834 Lbs. for 4 diaphragms.

DIAPHRAGM DETAILS
FOR
103'-0" DECK BULB TEE GIRDER BRIDGE

29'-10" ROADWAY
OVER RANDALL CREEK
STR. NO. 27498312

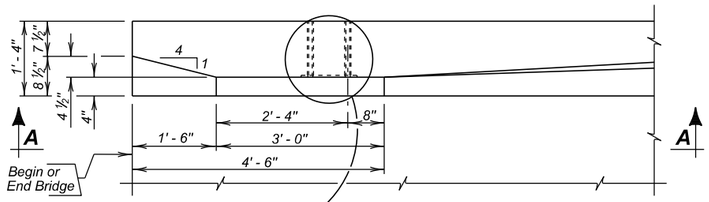
0° SKEW
SEC. 17-T095N-R65W
HL-93

RANDALL CREEK RESTORATION AREA
SOUTH DAKOTA DEPARTMENT OF GAME, FISH, & PARKS
OCTOBER 2019

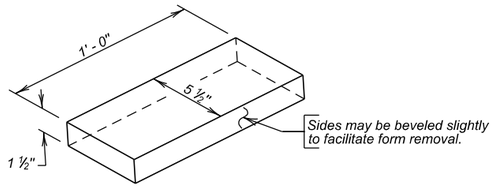
10 OF 13

DESIGNED BY	CK. DES. BY	DRAFTED BY	
WJK	JLM	SMH	BRIDGE ENGINEER

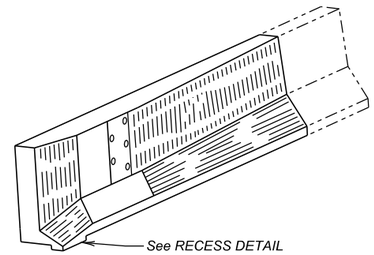
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	RanC20Pa	24	30



PART PLAN

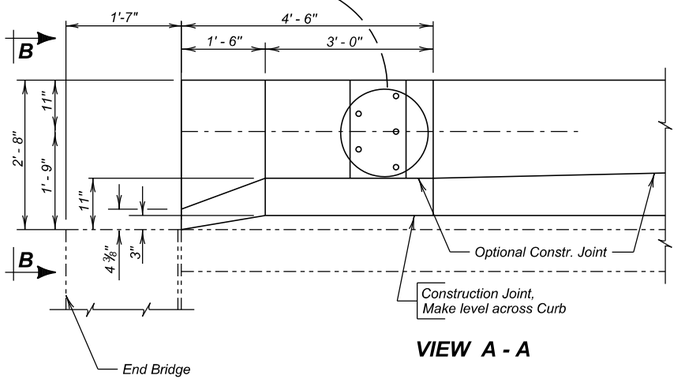


RECESS DETAIL

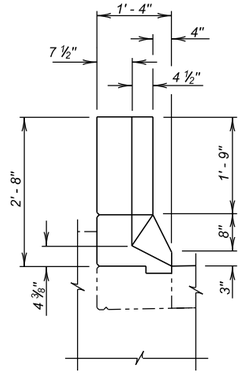


ISOMETRIC VIEW

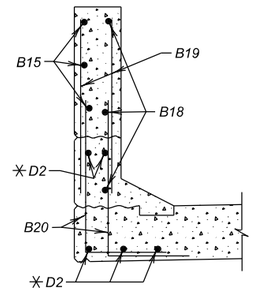
See Std. ℄ No. 630. 92



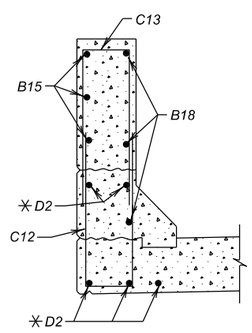
VIEW A - A



VIEW B - B



SEC. C - C



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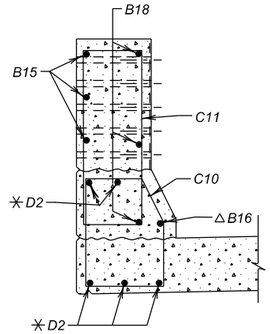
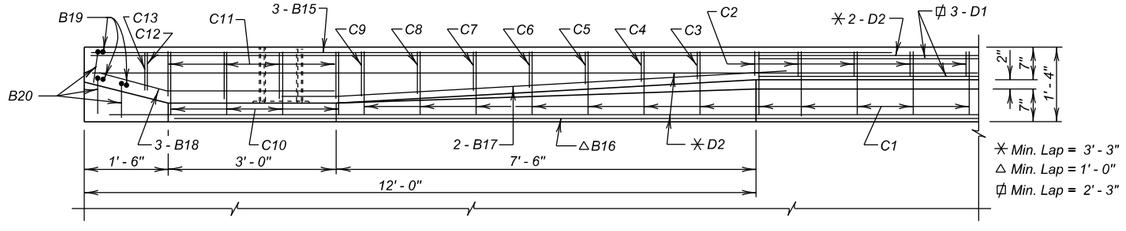
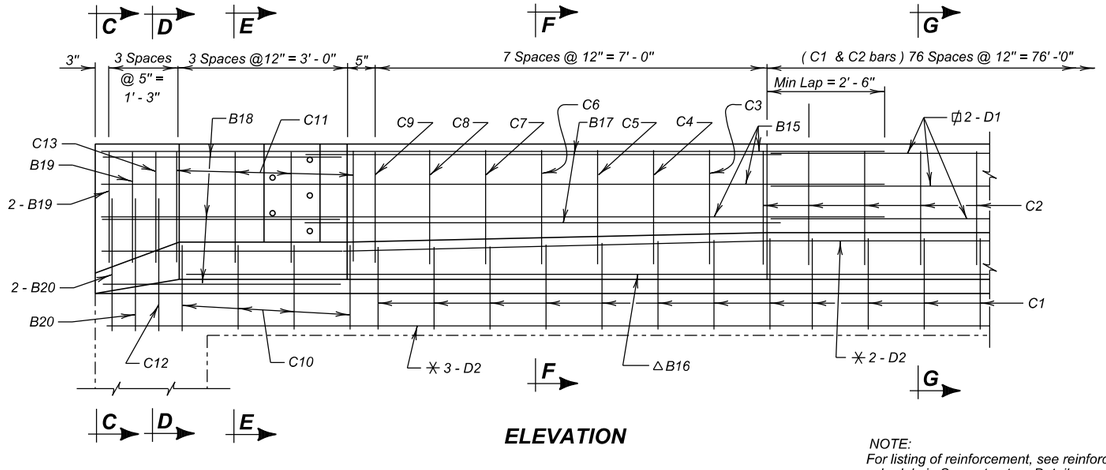


SEC. E - E

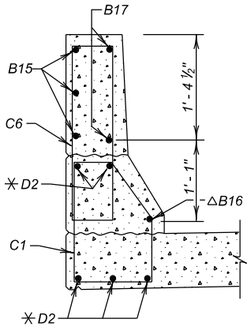


PLAN

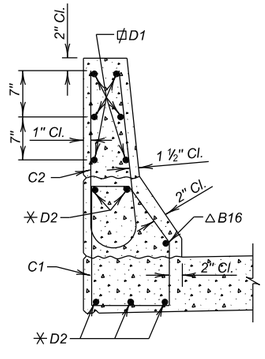


ELEVATION

NOTE:
For listing of reinforcement, see reinforcing schedule in Superstructure Details.



SEC. F - F

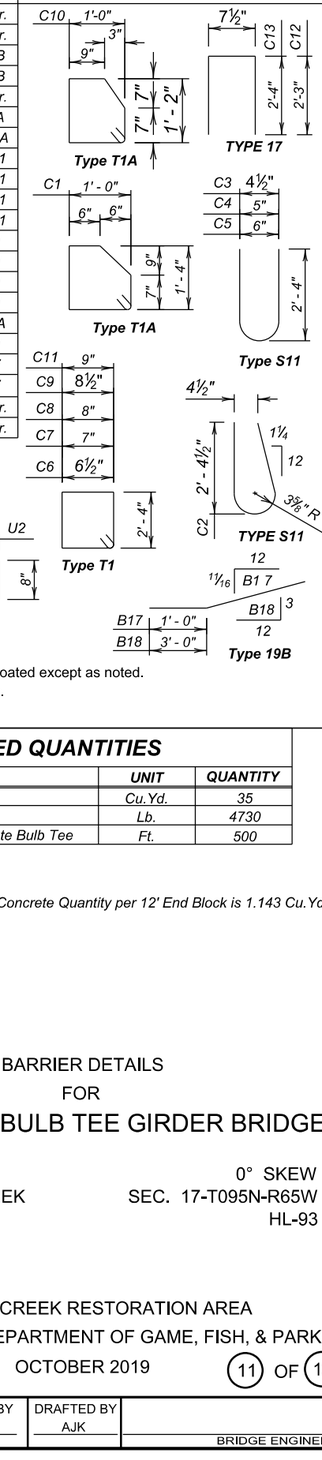


SEC. G - G

REINFORCING SCHEDULE

Mk.	No.	Size	Length	Type
B15	12	5	14' - 6"	Str.
B16	4	4	49' - 3"	Str.
B17	8	4	8' - 6"	19B
B18	12	8	4' - 3"	19B
B19	12	5	2' - 4"	Str.
B20	12	6	3' - 5"	17A
C1	182	5	5' - 17'	T1A
C2	154	5	5' - 1"	S11
C3	4	5	5' - 0"	S11
C4	4	5	5' - 0"	S11
C5	4	5	5' - 0"	S11
C6	4	5	6'- 8"	T1
C7	4	5	6'- 9"	T1
C8	4	5	6'- 11"	T1
C9	4	5	7' - 0"	T1
C10	16	6	5' - 7"	T1A
C11	16	5	7' - 1"	T1
C12	4	6	5' - 2"	17
C13	4	5	5' - 3"	17
D1	24	4	41'-6"	Str.
D2	20	5	53'-7"	Str.

Bending Details



NOTES:
All reinforcing steel shall be epoxy coated except as noted.
All dimensions are out to out of bars.
℄ Bars not to be epoxy coated.

ESTIMATED QUANTITIES

	ITEM	UNIT	QUANTITY
⊛	Class A45 Concrete, Bridge Deck	Cu.Yd.	35
℄	Epoxy Coated Reinforcing Steel	Lb.	4730
	6.5' Wide Deck Prestressed Concrete Bulb Tee	Ft.	500

℄ *Includes quantities for Barrier.*

⊛ *Includes quantities for Barrier.*
Barrier Curbs is 0.0836 Cu.Yd./Ft. Concrete Quantity per 12' End Block is 1.143 Cu.Yds.

BARRIER DETAILS
FOR
103'-0" DECK BULB TEE GIRDER BRIDGE

29'-10" ROADWAY
OVER RANDALL CREEK
STR. NO. 27498312

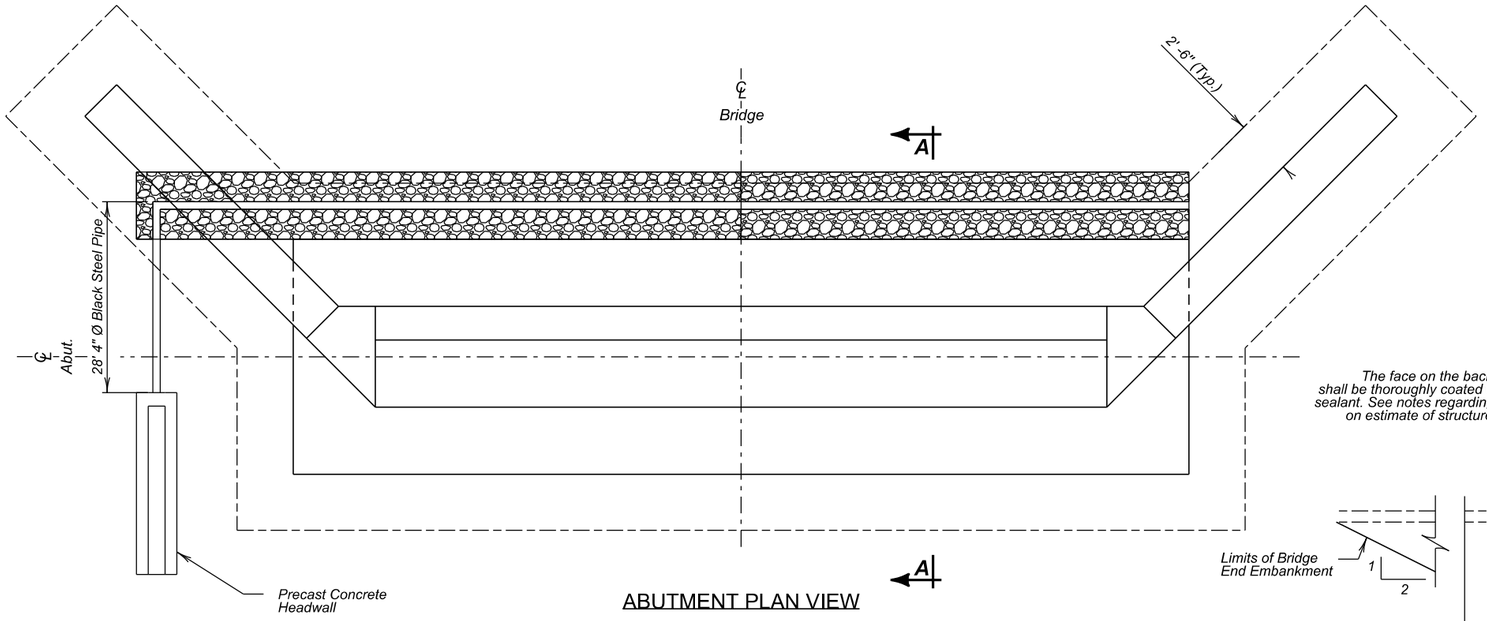
0° SKEW
SEC. 17-T095N-R65W
HL-93

RANDALL CREEK RESTORATION AREA
SOUTH DAKOTA DEPARTMENT OF GAME, FISH, & PARKS
OCTOBER 2019

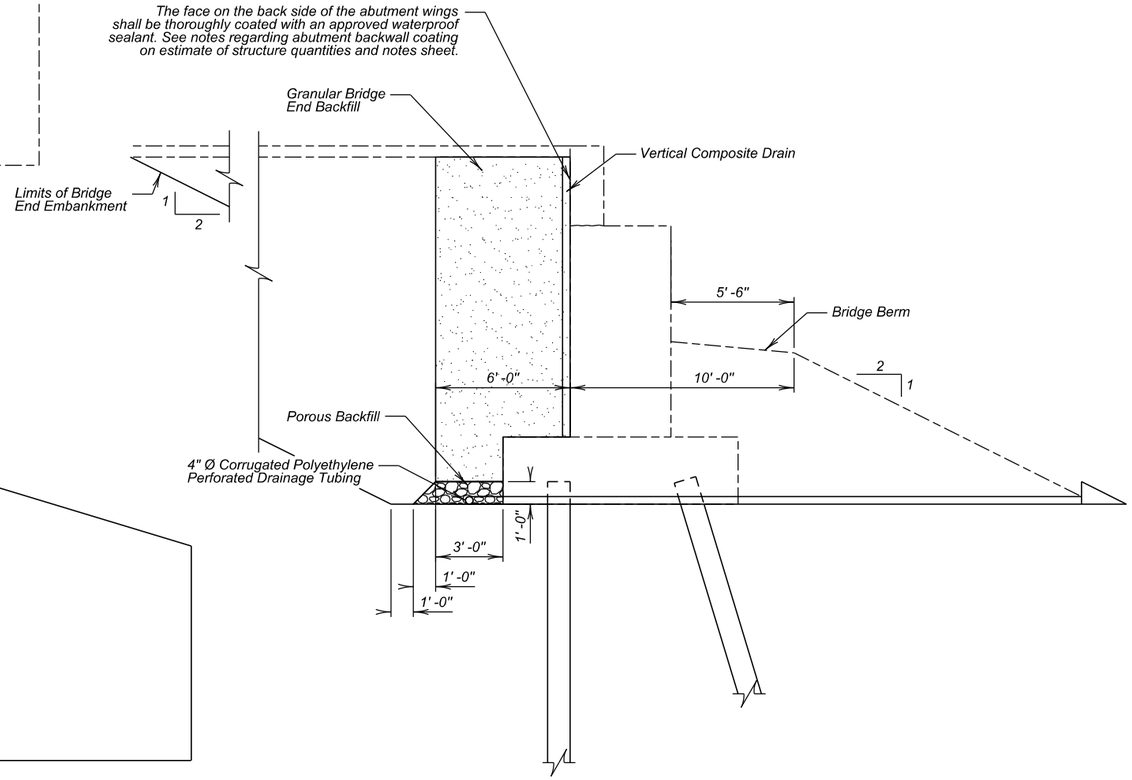
11 OF 13

DESIGNED BY	CK. DES. BY	DRAFTED BY	
LJB	JLM	AJK	BRIDGE ENGINEER

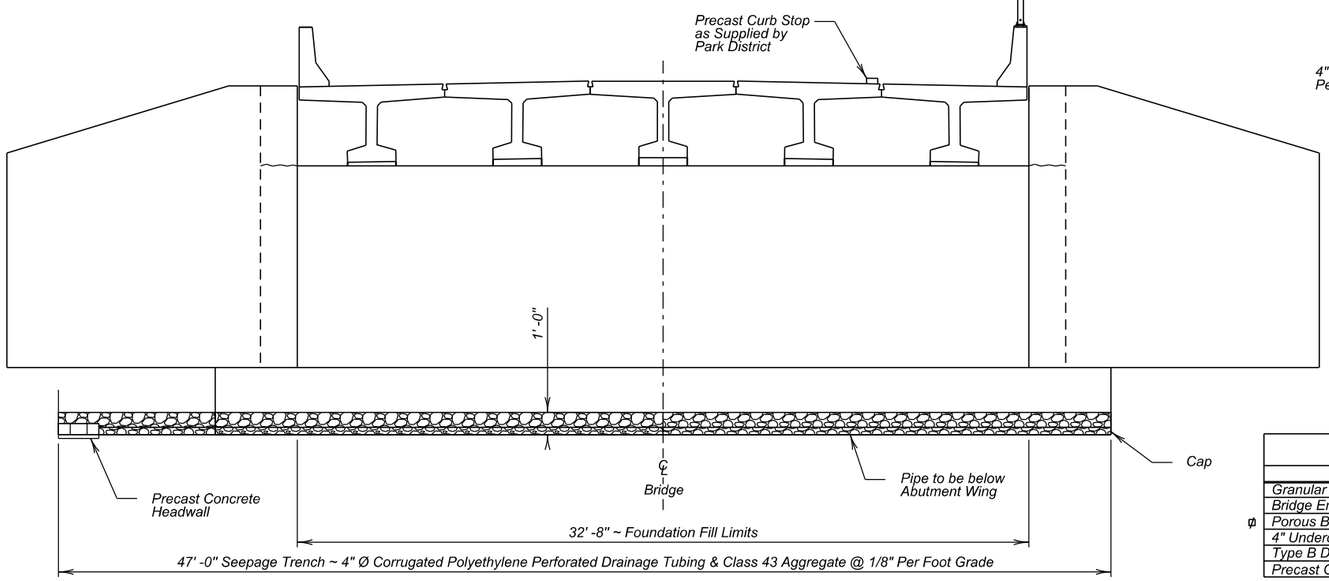
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	RanC20Pa	25	30



ABUTMENT PLAN VIEW



SECTION A-A



ABUTMENT ELEVATION VIEW

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Granular Bridge End Backfill	Cu. Yd.	256
Bridge End Embankment	Cu. Yd.	798
℔ Porous Backfill	Ton	22
4" Underdrain Pipe	Ft.	151
Type B Drainage Fabric	Cu. Yd.	340
Precast Concrete Headwall for Drain	Each	2

1. 94 ft. 4" dia. Corrugated Polyethylene Perforated Drainage Tubing.
2. 57 ft. 4" dia. Standard Black steel Pipe with Rodent Screens.
3. 554 sq. ft. Vertical Composite Drain.
4. 820 sq. ft. 6 mil Polyethylene Sheeting. (not including laps)

Items 1 thru 4 are approximate quantities contained in the 4" Underdrain Pipe and are for information only.

℔ For estimating purposes only, a factor of 1.89 tons/cu. yd. was used to convert cu. yds. to tons.

ABUTMENT UNDERDRAIN DETAILS

FOR

103'-0" DECK BULB TEE GIRDER BRIDGE

29'- 10" ROADWAY — 0° SKEW

OVER RANDALL CREEK — SEC. 17-T095N-R65W

STR. NO. 27498312 — HL-93

RANDALL CREEK RESTORATION AREA

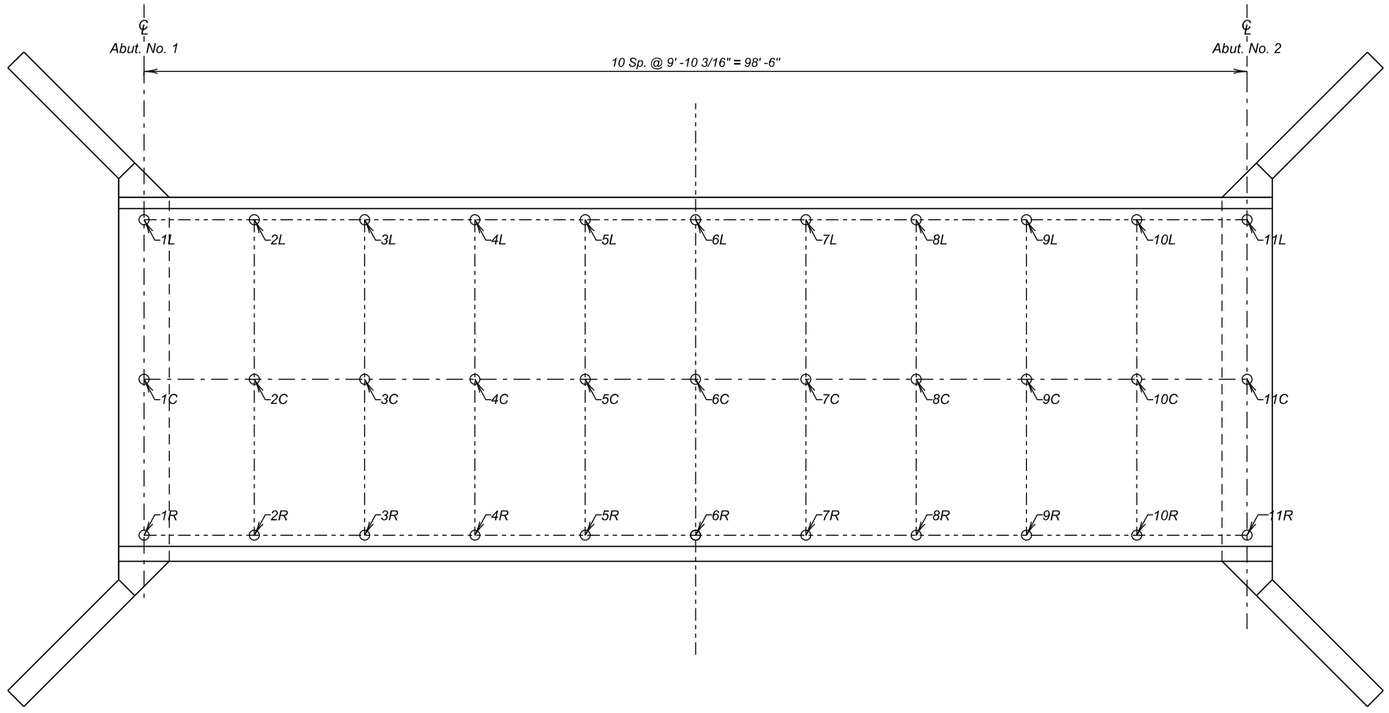
SOUTH DAKOTA DEPARTMENT OF GAME, FISH, & PARKS

OCTOBER 2019

12 OF 13

DESIGNED BY	CK. DES. BY	DRAFTED BY	
LJB	JLM	AJK	BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	RanC20Pa	26	30



PLAN

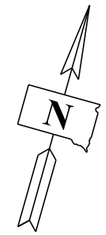


TABLE OF AS-BUILT ELEVATIONS - BRIDGE DECK

Location	Elevation	Location	Elevation	Location	Elevation
1L		1C		1R	
2L		2C		2R	
3L		3C		3R	
4L		4C		4R	
5L		5C		5R	
6L		6C		6R	
7L		7C		7R	
8L		8C		8R	
9L		9C		9R	
10L		10C		10R	
11L		11C		11R	

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY
Bridge Elevation Survey	L.S.	Lump Sum

TABLE OF ELEVATIONS - BRIDGE SURVEY MARKERS

LOCATION	STATION - OFFSET	ELEVATION
Begin Bridge		
End Bridge		

NOTE:

The Contractor shall be responsible for producing the As-Built Elevation Survey soon after construction is complete and before the bridge is opened to traffic. The As-Built Elevation of the Bridge shall be taken and recorded at the locations shown by the table on this sheet. The completed table shall be given to the Engineer who will forward a copy to the Office of Bridge Design and the Regin Office.

The elevations to be recorded in these tables shall be based on the National Geodetic Survey (NGS) North American Vertical Datum of 1988 (NAVD88).

AS - BUILT ELEVATION SURVEY
FOR
103'-0" DECK BULB TEE GIRDER BRIDGE

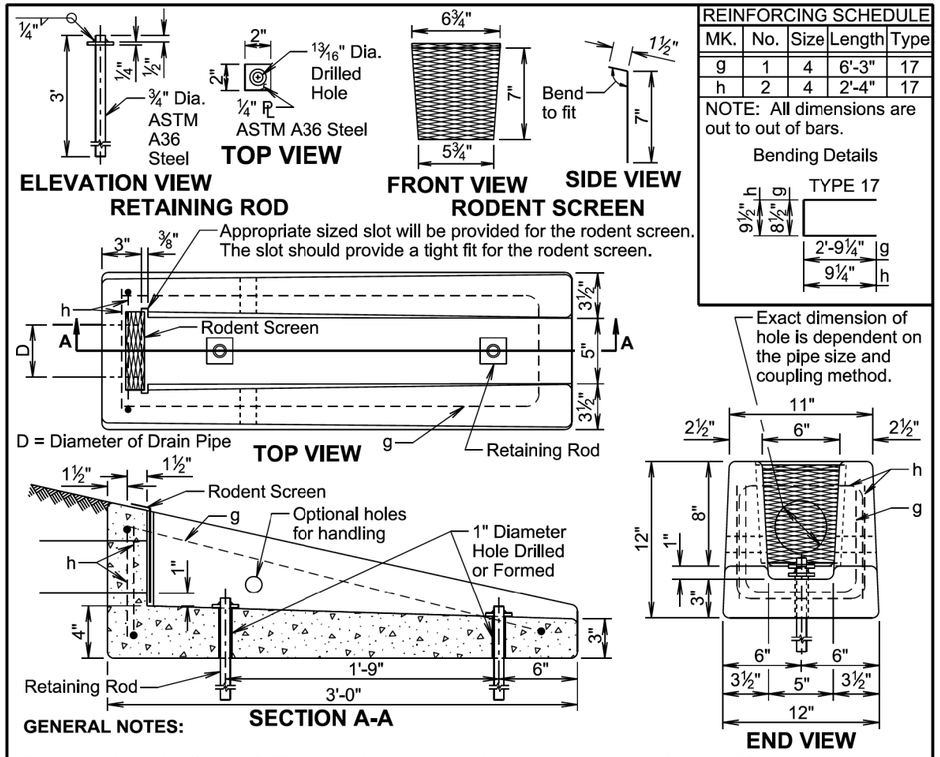
29'-10" ROADWAY
OVER RANDALL CREEK
STR. NO. 27498312

0° SKEW
SEC. 17-T095N-R65W
HL-93

RANDALL CREEK RESTORATION AREA
SOUTH DAKOTA DEPARTMENT OF GAME, FISH, & PARKS
OCTOBER 2019

13 OF 13

DESIGNED BY	CK. DES. BY	DRAFTED BY	
LJB	JLM	AJK	BRIDGE ENGINEER



REINFORCING SCHEDULE				
MK.	No.	Size	Length	Type
g	1	4	6'-3"	17
h	2	4	2'-4"	17

NOTE: All dimensions are out to out of bars.

Bending Details

GENERAL NOTES:

The concrete will be Class M6. The concrete will conform to the requirements of Section 462 of the Specifications. It is estimated that each unit weighs approximately 210 pounds.

All reinforcing steel will conform to ASTM A615, Grade 60 and will be epoxy coated. The reinforcing steel will be securely retained to prevent displacement during placement of concrete. It is estimated that 7.3 pounds of reinforcing steel is required for each unit.

The pipe will be placed in the concrete headwall with the pipe end flush with the concrete surface adjacent to the rodent screen.

The rodent screen will be galvanized 13 Ga. steel with a diamond shaped flattened mesh pattern. The size will be ½". The size refers to the measurement across the smallest diamond shaped opening measured from the centers of the wires.

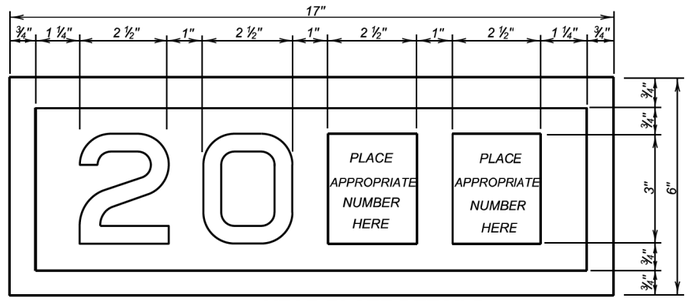
The retaining rod will be galvanized in accordance with ASTM A123 after all shop welding has been completed.

The drawing indicates using ½" fillets; however, ¾" chamfers may be substituted for the ½" fillets.

All costs for furnishing and installing the concrete headwall including equipment, labor, and materials including concrete, reinforcing steel, retaining rods, and rodent screen will be incidental to the contract unit price per each for "Precast Concrete Headwall for Drain".

June 26, 2019

Published Date: 3rd Qtr. 2019	SDDOT	PRECAST CONCRETE HEADWALL FOR DRAIN	PLATE NUMBER 430.50
			Sheet 1 of 1



YEAR PLATE DETAILS

GENERAL NOTES:

1. Year plates of the general dimensions shown shall be constructed on all box culverts and bridges. The year plates shall be constructed in reverse and attached to the forms in such a manner that the finished imprint in the concrete does not exceed one-half (½) inch in depth.

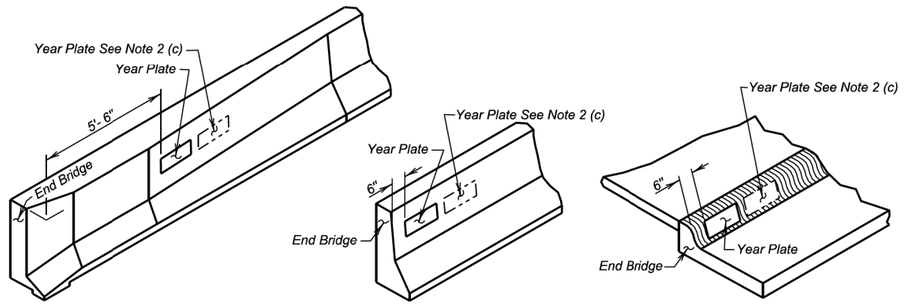
2. Year plates shall be located on structure (s) as follows:

   a. On cast-in-place box culverts the year plates shall be four and one - half (4 ½) inches below the top of the upstream parapet wall and centered laterally on the upstream face. On precast box culverts the year plate shall be centered laterally on the upstream face of the top slab. Where an extended interior wall interferes with this location, the year plate shall be centered in an adjacent barrel.

   b. On bridges with six (6) inch curbs or "Jersey" shaped barriers with no endblocks, the year plate shall be centered vertically on the curb face approximately six (6) inches from the end of the bridge, or as designated by the Engineer. On bridges with "Jersey" shaped barrier endblocks, the year plate shall be centered on the upper sloped portion of the barrier approximately 5'- 6" from the end of the bridge, or as designated by the Engineer. There shall be one year plate at each end of the bridge on opposite sides.

   c. When the plans specify that both the original date of construction and the date of reconstruction are to be shown, one date shall be placed as listed above and the other located adjacent to it. Both year plates shall be shown at each end of the bridge on opposite sides.

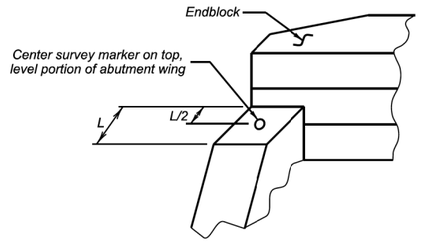
3. There will be no separate measurement or payment made for year plates on box culverts and bridges. All costs for this work shall be incidental to other contract items.



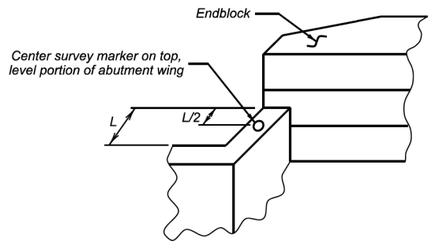
June 26, 2012

Published Date: 3rd Qtr. 2019	SDDOT	YEAR PLATE DETAILS	PLATE NUMBER 460.02
			Sheet 1 Of 1

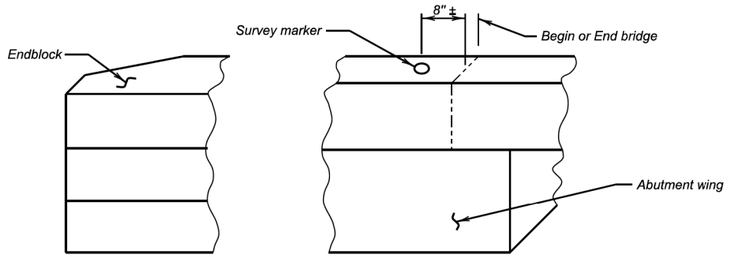
103'-0" DECK BULB TEE GIRDGER BRIDGE
STR. NO. 27498312
OCTOBER 2019



ABUTMENT WITH "STRAIGHT" WINGS



ABUTMENT WITH "SWEPT BACK" WINGS



ABUTMENT WITH "SWEPT BACK" WINGS

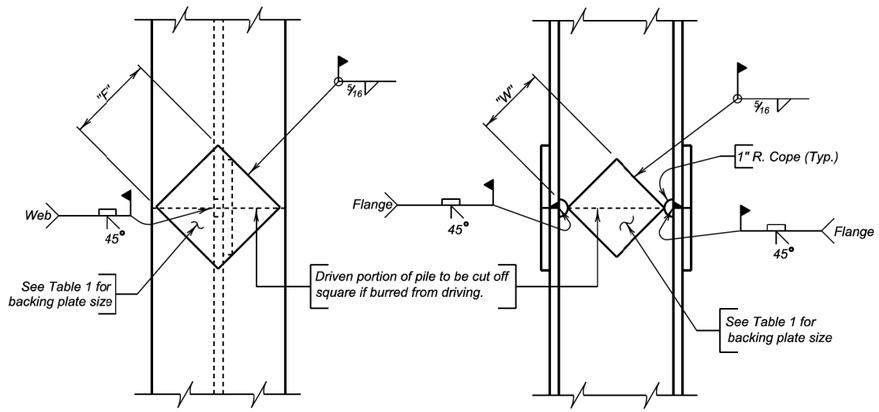
(Endblock on top of wings)

GENERAL NOTES:

1. Survey markers shall be located at each abutment on the same side of the bridge as the year plate. Place survey markers on abutment wings as shown. Two survey markers will be required at each bridge.
2. Survey markers shall be of a type intended for installation in concrete, be made of solid brass or bronze, have a domed top and be either a 3" top diameter (with a ⅜" X 2" long ribbed shank), or a US Army Corps of Engineers Type C Disc with a 3 ½" top diameter.
3. There will be no separate measurement or payment made for survey markers. All costs for this work shall be incidental to the other contract items.

June 26, 2012

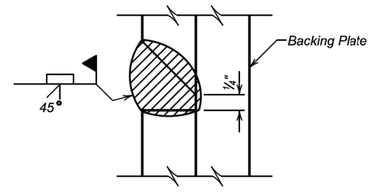
Published Date: 3rd Qtr. 2019	SDDOT	BRIDGE SURVEY MARKER	PLATE NUMBER 460.05
			Sheet 1 of 1



NOTE:

Prepare joint surfaces lower end of upper section on the ground and weld on backing plates; then place upper section on lower section and weld.

COMPLETE JOINT PENETRATION WELD DETAIL



GENERAL NOTES:

1. Steel for backing plates shall conform to ASTM A709 Grade 50.
2. Welding and weld inspection shall be in conformance with AWS D1.5 (Current Year) Bridge Welding Code - Steel.
3. Welder must be certified and registered with the SDDOT.
4. Backing plate shall at a minimum be as thick as the web of the pile being spliced.
5. Web must be coped with 1 inch radius.
6. Submit Welding Procedure Specification (WPS) to Bridge Construction Engineer for approval prior to pile driving.

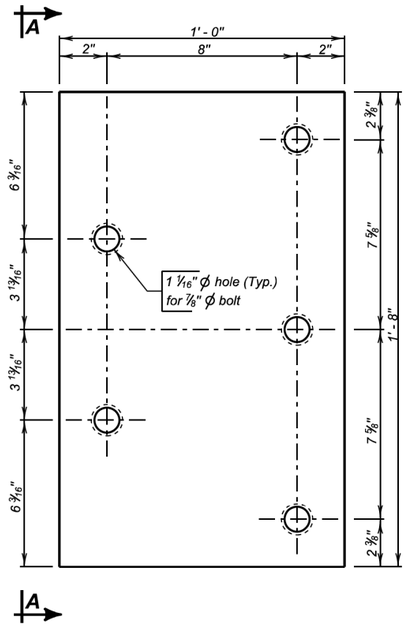
TABLE 1
(BACKING PLATES)

PILE	10"	12"	14"
"F" FLANGE	6 ½"	8"	10"
"W" WEB	4 ¾"	6 ¼"	7 ½"

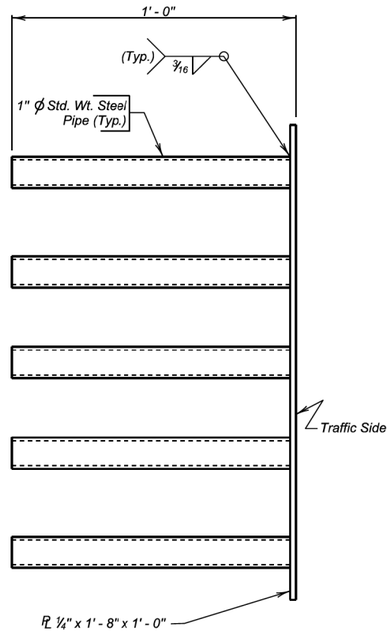
December 23, 2012

Published Date: 3rd Qtr. 2019	SDDOT	STEEL PILE SPLICE DETAILS	PLATE NUMBER 510.40
			Sheet 1 of 1

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	RanC20Pa	29	30



ELEVATION



VIEW A - A

GENERAL NOTES:

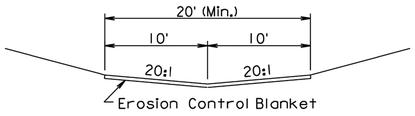
1. Steel plate for the insert assembly shall conform to ASTM A709 Grade 36. The steel pipes shall conform to ASTM A53 or ASTM A500 Grade B.
2. Welding and weld inspection shall be in conformance with AWS D1.1 - (Current Year) Structural Welding Code - Steel.
3. After fabrication, galvanize in accordance with AASHTO M111 (ASTM A123).
4. Bolts, nuts, and washers shall be provided with each assembly. Bolts shall be galvanized and conform to the requirements of ASTM A307, A325, or A449. Plain washers shall be galvanized and conform to ASTM F844.
5. Bolt heads shall be placed on the traffic side of the endblock. Bolt projection at the back side of the insert shall not exceed 1 inch beyond the nut.
6. The cost of the 5 bolt insert plate assembly complete in place including welding and galvanizing shall be incidental to the contract unit price per Cubic Yard for " Class A45 Concrete, Miscellaneous ", " Class A45 Concrete, Bridge Deck ", or " Class A45 Concrete, Bridge Repair ", as applicable.

December 23, 2013

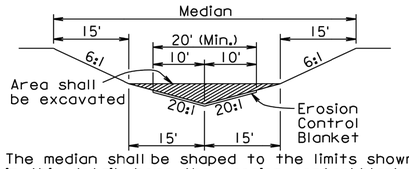
Published Date: 3rd Qtr. 2019	SDDOT	5 BOLT INSERT PLATE ASSEMBLY	PLATE NUMBER 630.92
			Sheet 1 of 1

103'-0" DECK BULB TEE GIRDER BRIDGE
STR. NO. 27498312
OCTOBER 2019

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	RanC20Pa	30	30

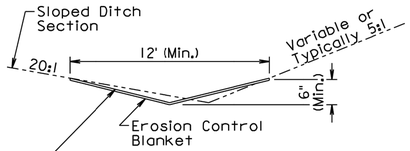


STANDARD DITCH SECTION

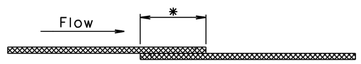


The median shall be shaped to the limits shown in this detail where the erosion control blanket will be placed.

MEDIAN SECTION



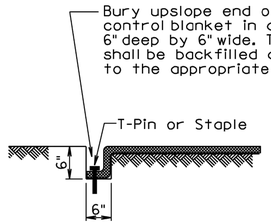
SLOPED DITCH SECTION



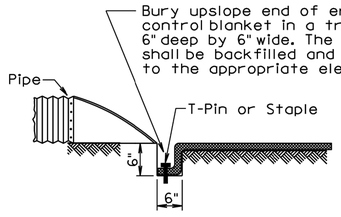
* Use a 4" (Min.) overlap wherever two widths of erosion control blanket are applied side by side.

* Use a 6" (Min.) overlap wherever one roll of erosion control blanket ends and another begins.

OVERLAP DETAIL



TRENCH DETAIL



PIPE END DETAIL

GENERAL NOTES:

Prior to placement of the erosion control blanket, the areas shall be properly prepared, shaped, seeded, and fertilized.

Erosion control blanket shall be unrolled in the direction of the flow of water when placed in ditches and on slopes. The upslope end of the erosion control blanket shall be buried in a trench 6" wide by 6" deep. There shall be at least a 6" overlap wherever one roll of erosion control blanket ends and another begins, with the upslope erosion control blanket placed on top of the downslope erosion control blanket.

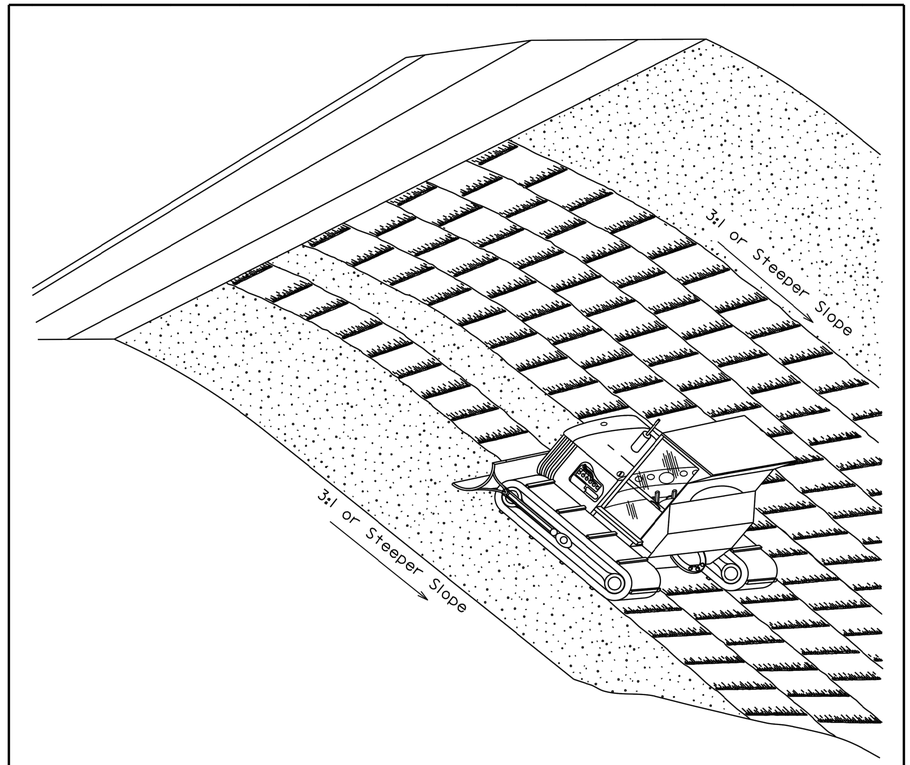
The erosion control blanket shall be pinned to the ground according to the manufacturer's installation recommendations.

After the placement of the erosion control blanket, the Contractor shall fine grade along all edges of the blanket to maintain a uniform slope adjacent to the blanket and level any low spots which might prevent uniform and unrestricted flow of side drainage directly onto the erosion control blanket.

All ditch sections shall be shaped when installing the erosion control blanket. All costs for shaping the ditches shall be incidental to the contract unit price per foot for "Shaping for Erosion Control Blanket".

December 23, 2004

Published Date: 3rd Qtr. 2019	SDDOT	**EROSION CONTROL BLANKET**	PLATE NUMBER 734.01
			Sheet 1 of 1



GENERAL NOTES:

Where practical, surface roughening shall be done on slopes 3:1 and steeper and on slopes deemed necessary by the Engineer.

The equipment used for surface roughening shall be equipped with tracks that are capable of creating ridges in the soil that are perpendicular to the slope. The final condition of the surface roughening shall be approved by the Engineer.

Measurement for surface roughening shall be to the nearest tenth of an acre.

All costs associated with surface roughening including labor, equipment, and materials shall be incidental to the contract unit price per acre for "Surface Roughening".

June 26, 2009

Published Date: 3rd Qtr. 2019	SDDOT	**SURFACE ROUGHENING**	PLATE NUMBER 734.25
			Sheet 1 of 1

103'-0" DECK BULB TEE GIRDER BRIDGE

STR. NO. 27498312

OCTOBER 2019