STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	085-468	1	59

Plotting Date: 09/23/2014

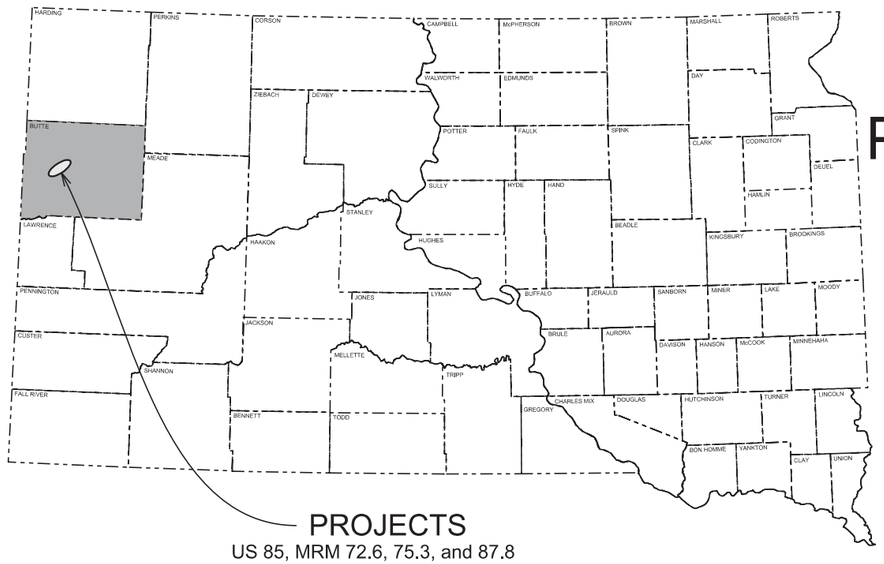
STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED

PROJECTS 085-468-10-146-229, 085-468 & 085-468-10-249-129 US HIGHWAY 85 BUTTE COUNTY

Flood Repair

PCN I3LN, I3LQ, & I3LP



PROJECTS
US 85, MRM 72.6, 75.3, and 87.8

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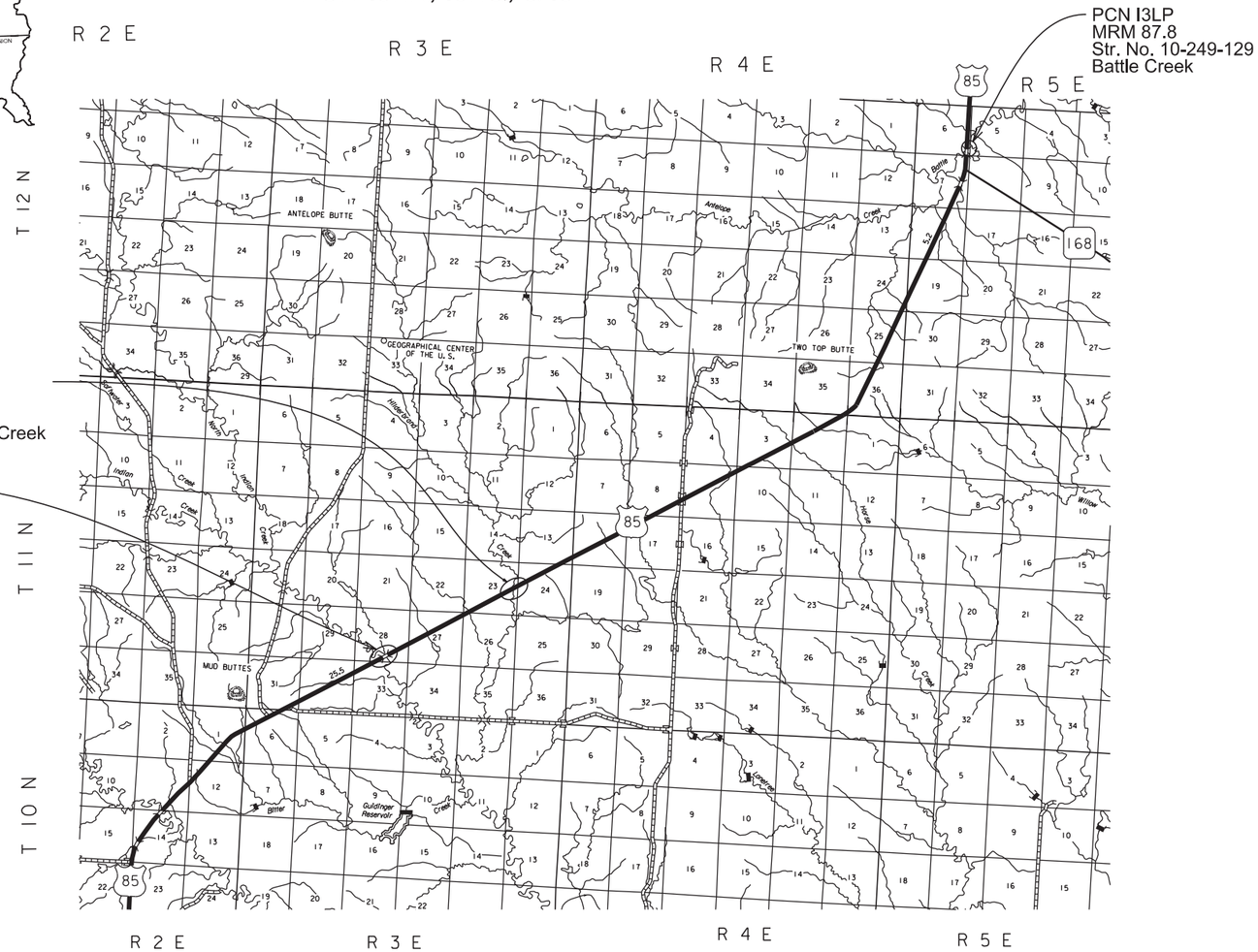

DESIGN DESIGNATION

ADT (2013)	1417
ADT (2033)	1596
DHV	210.7
D	51 %
T DHV	12.3 %
T ADT	27.0 %
V	65 MPH

STORM WATER PERMIT

None Required

Plot Scale - 1:200
Plotted From - trrc12608
File - ...\Phase 2\title.dgn

ESTIMATE OF QUANTITIES

I3LN

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
110E0500	Remove Pipe Culvert	104	Ft
110E0510	Remove Pipe End Section	1	Each
110E5450	Salvage Riprap	248.0	CuYd
110E7802	Remove Fence for Reset	200	Ft
120E0600	Contractor Furnished Borrow	2,200	CuYd
230E0020	Placing Contractor Furnished Topsoil	100	CuYd
250E0020	Incidental Work, Grading	Lump Sum	LS
450E4757	18" CMP 12 Gauge, Furnish	104	Ft
450E4760	18" CMP, Install	104	Ft
450E5406	18" CMP Safety End, Furnish	2	Each
450E5407	18" CMP Safety End, Install	2	Each
462E0200	Controlled Density Fill	6.4	CuYd
620E0520	Type 2 Temporary Fence	200	Ft
620E4100	Reset Fence	200	Ft
634E0010	Flagging	100	Hour
634E0100	Traffic Control	374	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
700E0310	Class C Riprap	1,174.0	Ton
700E2000	Place Riprap	248.0	CuYd
730E0210	Type F Permanent Seed Mixture	13	Lb
731E0100	Fertilizing	500	Lb
732E0250	Fiber Mulching	1,000	Lb
734E0900	Temporary Diversion Channel and/or Pipe	1	Each
831E0110	Type B Drainage Fabric	1,540	SqYd

I3LQ

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
110E7802	Remove Fence for Reset	200	Ft
120E0600	Contractor Furnished Borrow	180	CuYd
250E0020	Incidental Work, Grading	Lump Sum	LS
260E6010	Granular Material	21.8	Ton
460E0120	Class A45 Concrete, Box Culvert	16.0	CuYd
480E0100	Reinforcing Steel	1,265	Lb
620E0520	Type 2 Temporary Fence	200	Ft
620E4100	Reset Fence	200	Ft
634E0010	Flagging	100	Hour
634E0100	Traffic Control	374	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
700E0310	Class C Riprap	295.0	Ton
734E5005	Dewatering	Lump Sum	LS
831E0110	Type B Drainage Fabric	272	SqYd

I3LP

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
110E5450	Salvage Riprap	23.0	CuYd
110E7802	Remove Fence for Reset	200	Ft
120E0600	Contractor Furnished Borrow	365	CuYd
230E0020	Placing Contractor Furnished Topsoil	50	CuYd
250E0020	Incidental Work, Grading	Lump Sum	LS
462E0200	Controlled Density Fill	18.0	CuYd
620E0520	Type 2 Temporary Fence	200	Ft
620E4100	Reset Fence	200	Ft
634E0010	Flagging	100	Hour
634E0100	Traffic Control	374	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
700E0310	Class C Riprap	105.0	Ton
700E2000	Place Riprap	23.0	CuYd
730E0210	Type F Permanent Seed Mixture	13	Lb
731E0100	Fertilizing	500	Lb
732E0250	Fiber Mulching	1,000	Lb
734E0900	Temporary Diversion Channel and/or Pipe	1	Each
831E0110	Type B Drainage Fabric	135	SqYd

SPECIFICATIONS

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

ENVIRONMENTAL COMMITMENTS

An Environmental Commitment is a measure that SDDOT commits to implement in order to avoid, minimize, and/or mitigate a real or potential environmental impact. Environmental commitments to various agencies and the public have been made to secure approval of this project. An agency mentioned below with permitting authority can influence a project if perceived environmental impacts have not been adequately addressed. Unless otherwise designated, the Contractor's primary contact regarding matters associated with these commitments will be the Project Engineer. These environmental commitments are not subject to change without prior written approval from the SDDOT Environmental Office. The environmental commitments associated with this project are as follows:

COMMITMENT B: FEDERALLY THREATENED, ENDANGERED, AND PROTECTED SPECIES

COMMITMENT B2: WHOOPING CRANE

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

Action Taken/Required:

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

COMMITMENT C: WATER SOURCE

The Contractor shall not withdraw water with equipment previously used outside the State of South Dakota without prior approval from the SDDOT Environmental Office. Thoroughly wash all construction equipment before entering South Dakota to reduce the risk of invasive species introduction into the project vicinity.

Action Taken/Required:

The Contractor shall obtain the necessary permits from the regulatory agencies such as the Department of Environment and Natural Resources (DENR) and the United States Army Corps of Engineers (COE) prior to executing water extraction activities.

COMMITMENT E: STORM WATER

Action Taken/Required:

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

COMMITMENT H: WASTE DISPOSAL SITE

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

Action Taken/Required:

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

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

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

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

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

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

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

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

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

COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES

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

Action Taken/Required:

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

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

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

The Contractor shall submit the records search or cultural resources survey report and if the location of the site is within the current geographical or historic boundaries of any South Dakota reservation to SDDOT Environmental Engineer, 700 East Broadway Avenue, Pierre, SD 57501-2586 (605-773-3180). SDDOT will submit the information to the appropriate SHPO/THPO. Allow **30 Days** from the date this information is submitted to the Environmental Engineer for SHPO/THPO review.

If evidence for cultural resources is uncovered during project construction activities, then such activities shall cease and the Project Engineer shall be immediately notified. The Project Engineer will contact the SDDOT Environmental Engineer in order to determine an appropriate course of action.

SHPO/THPO review does not relieve the Contractor of the responsibility for obtaining any additional permits and clearances for staging areas, borrow sites, waste disposal sites, or material processing sites that affect wetlands, threatened and endangered species, or waterways. The Contractor shall provide the required permits and clearances to the Project Engineer at the preconstruction meeting.

COMMITMENT N: SECTION 404 PERMIT

The SDDOT has obtained a Section 404 Permit from the US Army Corps of Engineers for the permanent actions associated with this project.

Action Taken/Required:

The Contractor shall comply with all requirements contained in the Section 404 permit.

The Contractor shall also be responsible for obtaining a Section 404 permit for any dredge, excavation, or fill activities associated with staging areas, borrow sites, waste disposal sites, or material processing sites that affect wetlands or waters of the United States.

SEQUENCE OF OPERATIONS

The intent of the plan sequence of operations is to have the least amount of impact on the traveling public and adjacent landowners. Approval of an alternate sequence of operations will only be allowed when the proposed changes meet with the Department’s intent for traffic control and sequencing of the work. An alternate sequence shall be submitted for review a minimum of two weeks prior to potential implementation. Work shall proceed for each structure according .to the following sequence or as approved by the Engineer:

1. Set up Traffic Control.
2. Remove Fence for Reset (if required).
3. Complete structure repairs.
4. Place topsoil (if required).
5. Complete erosion control measures.
6. Reset Fence
7. Remove Traffic Control

UTILITIES

Utilities are not planned to be affected on this project. If utilities are identified near the improvement area through the SD One Call Process as required by South Dakota Codified Law 49-7A and Administrative Rule Article 20:25, the Contractor shall contact the Project Engineer to determine modifications that will be necessary to avoid utility impacts.

The Contractor shall contact the involved utility companies through South Dakota One Call (1-800-781-7474) prior to starting work. It shall be the responsibility of the Contractor to coordinate work with the utility owners to avoid damage to existing facilities.

FENCE

An estimated quantity of 200' of Remove Fence for Reset and Reset Fence has been provided for each structure to complete the work required. Additionally, an estimated quantity of 200' of Temporary Fence has also been provided per structure to be placed as directed by the Engineer. These quantities may be increased or decreased as directed by the Engineer.

Repairing any post panels damaged by construction activities shall be the responsibility of the Contractor.

Table of Fence Quantities

	Remove Fence for Reset	Type 2 Temporary Fence	Reset Fence
MRM	(Ft)	(Ft)	(Ft)
72.6	200	200	200
75.3	200	200	200
87.8	200	200	200

CMP CULVERT – STRUCTURE NO. 10-146-229

The 12" CMP culvert in the north-east quadrant of Structure No. 10-146-229 shall be replaced.

The Contractor shall remove the in-place 104' - 12" CMP and one CMP End Section.

A 104' long -18" CMP shall then be installed with two 18" CMP Safety Ends.

Table of Pipe Quantities

	Remove Pipe Culvert	Remove Pipe End Section	18" CMP 12 Gauge, Furnish	18" CMP, Install	18" CMP Safety End, Furnish	18" CMP Safety End, Install
Location	(Ft)	(Each)	(Ft)	(Ft)	(Each)	(Each)
PCN I3LN MRM 72.6 Indian Creek	104	1	104	104	2	2

PLACING CONTRACTOR FURNISHED TOPSOIL

It is anticipated that a larger volume of topsoil will be needed for the new grade than can be salvaged from the existing grade. The Contractor will be required to furnish and place 4 inches of topsoil on roadway inslopes and areas as determined by the Engineer during construction.

All costs to furnish and place the topsoil shall be incidental to the contract unit price per cubic yard for "Placing Contractor Furnished Topsoil".

MYCORRHIZAL INOCULUM

Mycorrhizal inoculum shall consist of mycorrhizal fungi spores and mycorrhizal fungi-infected root fragments in a solid carrier. The carrier may include organic materials, calcinated clay, or other materials consistent with application and good plant growth. The supplier shall provide certification of the fungal species claimed and the live propagule count. The inoculum shall include the following fungal species:

Glomus intraradices	25%
Glomus aggregatu	25%
Glomus mosseae	25%
Glomus etunicatum	25%

All seed shall be inoculated with a minimum of 100,000 live propagules of mycorrhizal fungi per acre. All costs of inoculating the seed shall be incidental to the contract unit price per pound for the corresponding permanent seed mixture.

FERTILIZING

The Contractor shall apply an all-natural slow release fertilizer prior to seeding or placing sod. The all-natural fertilizer shall have a minimum guaranteed analysis of 4-6-4 and be USDA Certified BioBased. It should provide a minimum of 4% (N) nitrogen with a minimum water insoluble nitrogen (WIN) fraction of 3.2%, a minimum of 6% (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 shall 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 shall 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 shall 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 all-natural slow release fertilizer shall be applied according to the manufacturer's application recommendations.

The application rate is 1,000 pounds per acre.

The all-natural slow release fertilizer shall be from the list below or an approved equal:

Product	Manufacturer
Sustane	Sustane Corporate Headquarters Cannon Falls, Minnesota Phone: 1-800-352-9245 http://www.sustane.com/

PERMANENT SEEDING

The areas to be seeded comprise of all areas in Table of Erosion Repair and areas as directed by the Engineer.

All permanent seed shall be planted in the topsoil at a depth of ¼" to ½".

All seed broadcast must be raked or dragged in (incorporated) within the top ¼" to ½" of topsoil when possible. This requirement may be waived by the Engineer during construction when raking or dragging is deemed not feasible by conventional methods.

The varieties listed for the seed mixture are preferred varieties. Native harvest seed will be allowed.

Type F Permanent Seed Mixture shall consist of the following:

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

FIBER MULCHING

Fiber mulch shall be applied in a separate operation following permanent seeding.

An additional 2% by weight of tackifier shall be added to the fiber mulch product selected from the approved product list. If the product selected has guar gum tackifier included, then the additional 2% of tackifier shall be guar gum. If the product selected has synthetic tackifier included, then the additional 2% of tackifier shall be synthetic.

Fiber mulch shall be applied at the rate of 2000 pounds per acre.

The Contractor shall allow the fiber mulch to cure a minimum of 18 hours prior to watering or any storm event to ensure proper cohesion between the soil and fiber particles.

All costs for the additional tackifier added to the fiber mulch including labor, equipment, and materials shall be incidental to the contract unit price per ton for "Fiber Mulching".

The fiber mulch provided shall be from the approved product list. The approved product list for fiber mulch may be viewed at the following internet site:

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

TABLE OF SEEDING, MULCHING, AND FERTILIZING

Table Seeding, Mulching, and fertilizing					
Locaton	Area	Placing Contractor Furnished Topsoil	Type F Permanent Seed Mixture	Fertilizing	Fiber Mulching
MRM	Acres	(CuYd)	(Lb)	(Lb)	(Lb)
72.6	0.50	100	13	500	1000
87.8	0.50	50	13	500	1000

CONSTRUCTION PRACTICES FOR TEMPORARY WORKS IN WATERWAYS

No excavation shall be made below the ordinary high water elevation in waterways outside of caissons, cribs, cofferdams, steel piling, or sheeting.

All dredged or excavated materials shall be placed at a site above the ordinary high water elevation in a confined area (not classified as a wetland) 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 provided that 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 shall be removed with minimal disturbance to the streambed. Proper construction practices shall be used to minimize increases in suspended solids and turbidity in the waterway.

Bridge berms, wing dams, traffic diversions, channel reconstruction, grading, etc. shall 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 Contractors construction operations shall 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.

TEMPORARY DIVERSION CHANNEL AND/OR PIPE - MRM 72.6 & 87.8

A temporary stream diversion will be required to divert stream flows away from the work areas located along US Highway 85 at MRM 72.6 and MRM 87.8.

The type of temporary stream diversion device shall be chosen by the Contractor in accordance with the details provided in these plans. All costs for labor, equipment, materials to complete the temporary stream diversion shall be incidental to the contract unit price per each for “Temporary Diversion Channel and/or Pipe”. “Temporary Diversion Channel and/or Pipe” shall be paid for once per site regardless of the number of times water is diverted at each individual site.

TEMPORARY WORKS - MRM 75.3

Temporary works may be necessary during the work on the box culvert. No payment will be made for temporary works. All costs involved in designing, constructing, and removing temporary works shall be incidental to the other contract items.

DEWATERING – MRM 75.3

Dewatering will be necessary to create a dry work area to complete the box culvert repair. All costs associated with Dewatering the work area shall be incidental to the contract unit price per Lump Sum for “Dewatering”.

TRAFFIC CONTROL – GENERAL NOTES

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

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

3. Storage of vehicles and equipment shall be as near the right-of-way as possible. Contractor’s employees should mobilize at a location off the right-of-way and arrive at the work sites in a minimum number of vehicles necessary to perform the work. Indiscriminate driving and parking of vehicles within the right-of-way will not be permitted. Any damage of the vegetation, surfacing, embankment, delineators, and existing signs resulting from such indiscriminate use shall be repaired and/or restored by the Contractor, at no expense to the State, and to the satisfaction of the Engineer.

4. Existing guide, route, informational logo, regulatory, and warning signs shall be temporarily reset and maintained during construction. Removing, relocating, covering, salvaging and resetting of existing traffic control devices, including but not limited to, traffic signal heads, delineation, and signing shall be the responsibility of the Contractor. Non-applicable signing and all traffic control devices shall be covered or removed during periods of inactivity. Periods of inactivity shall be defined as no work taking place for a period of more than 48 hours. The cost of removing or covering non-applicable signs shall be incidental to the contract lump sum price for “Traffic Control, Miscellaneous”.

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

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

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

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

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

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

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

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

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

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

15. Drums are required in all lane closure tapers.

16. Hauling material to and from the project site shall be conducted in a safe manner by utilizing flaggers and appropriate traffic control devices to control traffic.

17. At the end of each day’s work all traffic, control devices shall be pulled off the roadway and taken down and traffic shall be opened to two lanes. Applicable signing shall remain in place, i.e. “Road Work Ahead” etc.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	085-468	6	59

INVENTORY OF TRAFFIC CONTROL DEVICES

I3LN

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
G20-2	36" x 18"	END ROAD WORK	2	17	34
W3-4	48" x 48"	BE PREPARED TO STOP	2	34	68
W20-1	48" x 48"	ROAD WORK AHEAD	2	34	68
W20-4	48" x 48"	ONE LANE ROAD AHEAD	2	34	68
W20-7a	48" x 48"	FLAGGER	2	34	68
W21-5	48" x 48"	SHOULDER WORK	2	34	68
				TOTAL UNITS	**374**

I3LQ

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
G20-2	36" x 18"	END ROAD WORK	2	17	34
W3-4	48" x 48"	BE PREPARED TO STOP	2	34	68
W20-1	48" x 48"	ROAD WORK AHEAD	2	34	68
W20-4	48" x 48"	ONE LANE ROAD AHEAD	2	34	68
W20-7a	48" x 48"	FLAGGER	2	34	68
W21-5	48" x 48"	SHOULDER WORK	2	34	68
				TOTAL UNITS	**374**

I3LP

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
G20-2	36" x 18"	END ROAD WORK	2	17	34
W3-4	48" x 48"	BE PREPARED TO STOP	2	34	68
W20-1	48" x 48"	ROAD WORK AHEAD	2	34	68
W20-4	48" x 48"	ONE LANE ROAD AHEAD	2	34	68
W20-7a	48" x 48"	FLAGGER	2	34	68
W21-5	48" x 48"	SHOULDER WORK	2	34	68
				TOTAL UNITS	**374**

~~STA 2+14 TO STA 3+54 LT. & RT.~~
~~(BASELINE STATIONING)~~
~~RESTORE BERM~~
~~SEE CROSS SECTIONS~~

~~STA 2+14 TO STA 3+54 LT. & RT.~~
~~(BASELINE STATIONING)~~
~~INSTALL RIPRAP~~

FED. HWY. ADMIN. NO.	STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
8	S.D.	~~NH 0085(00)72~~	~~10~~ 7	~~15~~ 59

085-468

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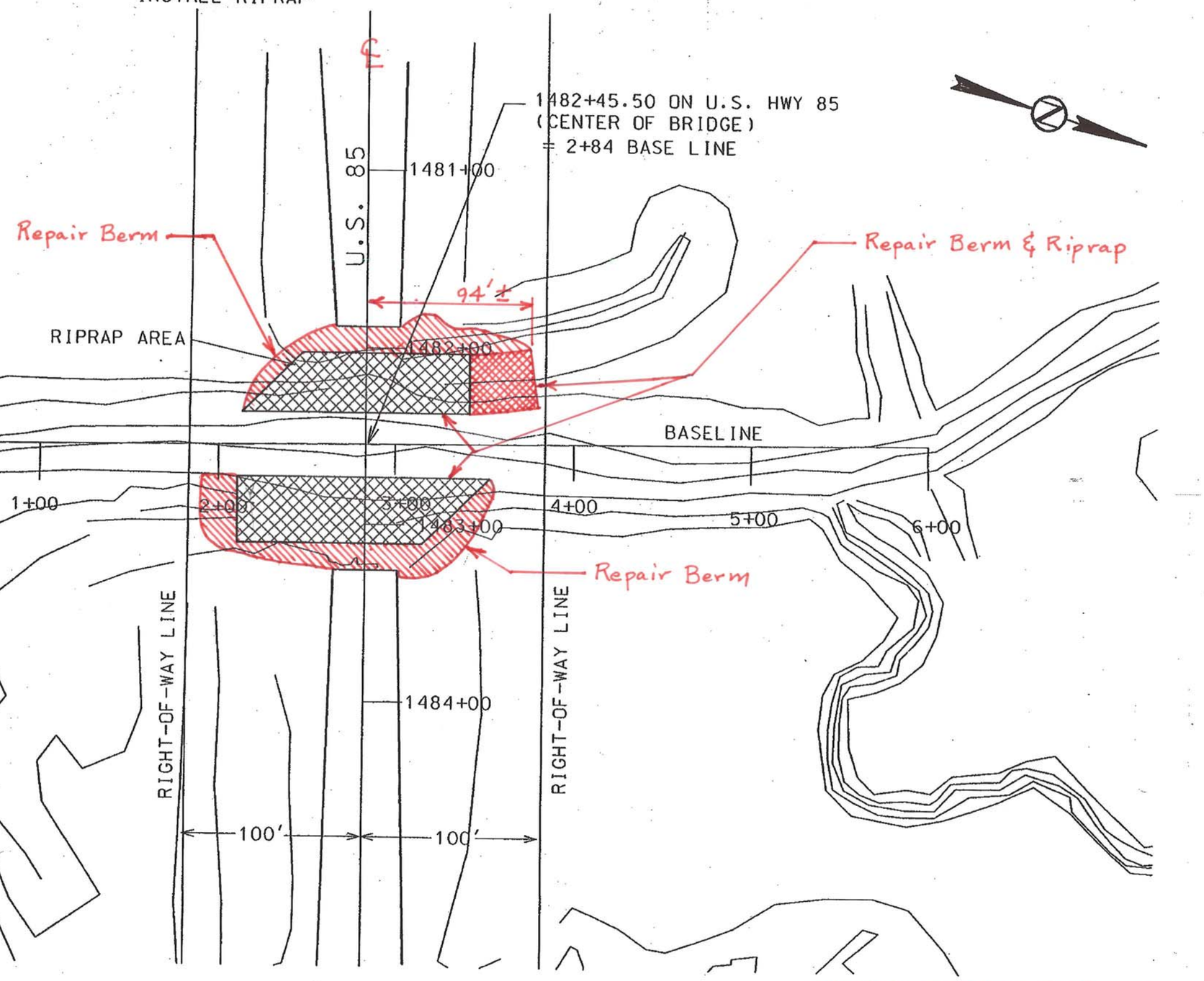

INDIAN CREEK REPAIR LAYOUT

Sheet 1 of 21

L20, J
$ LOAD 273IBG.DGN
$ G
IPARM
IPARM

DRAWN BY: DATE: CHECKED BY: DATE:

ESTIMATE OF STRUCTURE QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
110E5450	Salvage Riprap	248	Cu.Yd.
120E0600	Contractor Furnished Borrow	2200	CuYd
250E0020	Incidental Work, Grading	LS	LS
462E0200	Controlled Density Fill	6.4	CuYd
700E0310	Class C Riprap	1174	Ton
700E2000	Place Riprap	248	CuYd
831E0110	Type B Drainage Fabric	1540	SqYd

SPECIFICATIONS

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

DETAILS AND DIMENSIONS OF EXISTING BRIDGE

All details and dimensions of the existing bridge, contained in these plans, are based on the original construction plans and shop plans. It is the Contractor's responsibility to inspect and verify the actual field conditions and any necessary as-built dimensions affecting the satisfactory completion of the work required for this project.

SCOPE OF BRIDGE WORK & SEQUENCE OF OPERATIONS

All work on this structure shall be accomplished with the traffic control shown elsewhere in the plans. An alternate sequence of operations may be submitted by the Contractor for approval by the Engineer at the pre-construction meeting.

1. Fill the voids under existing Abutment No. 1 (southwest) with controlled density fill as shown in the plans.
2. Remove the existing riprap that is still in-place for reset.
3. Reshape the berm and wing wall slopes and install riprap as shown in the plans.

PRE-CONSTRUCTION MEETING

A pre-construction meeting is required prior to beginning the repair work. The purpose of the meeting is to review the plans and procedures. A representative from the Contractor and all Subcontractors shall attend this meeting along with Department personnel from the Area Office and Region Office. The Contractor must notify the Area Office at least three days prior to the meeting.

BRIDGE BERM REPAIR

1. The bridge berms experienced scour in front of and below the abutments as well as both upstream and downstream of the bridge. The berms shall be reshaped and reconstructed to their original template using on-site materials or borrow material as approved by the Engineer. Borrow material shall be furnished by the Contractor. The tops of the berms shall be placed at 6 ± feet below the bottom of the bridge slab. The Abutment 1 (Southwest) berm shall tie into the controlled density fill used to fill the voids under and directly in front of the abutment (see new detail).
2. Bench the berm slopes into the embankment during reshaping and reconstruction in accordance with Section 120.3.B.1 of the Standard Specifications For Roads and Bridges. Place the soil in horizontal lifts parallel to the abutments. Shape the berm in front of the wing walls to divert runoff from the roadway inslope away from the face of the berm slope. Compaction of the reconstructed embankment will be according to the Specified Density Method. Special equipment and/or additional effort may be required to accomplish compaction of the berms due to the confined work area and reduced vertical clearance.
3. All costs associated with berm reconstruction shall be incidental to the contract price for Incidental Work, Grading. Borrow required and all associated costs shall be paid for at the contract unit price per cubic yard for Contractor Furnished Borrow. The estimated quantity of Contractor furnished borrow is 2200 cubic yards.

RIPRAP

1. The Class C Riprap shall be placed to the configuration, limits and elevations shown on the Original Construction Plans. The stream banks in the areas of riprap placement shall be reconstructed to their original alignment and elevations as approved by the Engineer. Cost of reconstructing the stream banks shall be per the Bridge Berm Repair note.
2. The existing riprap that is still in place on the bridge berms under the bridge as well as both upstream and downstream of the bridge and including the riprap on the spur dike to 94' ± from the centerline of the bridge shall be removed for reset. All costs associated with removal of the existing riprap for reset shall be incidental to the contract unit price per cubic yard for Salvage Riprap. The estimated quantity is 248 cubic yards. Plan quantity will be paid for Salvage Riprap.
3. The existing drainage fabric shall be removed and disposed of by the Contractor. All costs shall be incidental to the contract price for Incidental Work, Grading.
4. Excavate and/or fill to limits shown on cross sections for riprap placement. Any excess material shall be disposed of by the Contractor as approved by the Engineer. All costs associated with excavating and disposing material and/or providing borrow material shall be incidental to the contract price for Incidental Work, Grading and the contract price per cubic yard for Contractor Furnished Borrow per the Bridge Berm Repair note.
5. Drainage fabric shall be placed underneath the limits of the reset riprap and new Class C Riprap. The fabric shall conform to Section 831 of the Standard Specifications.
6. The fabric shall be placed so that the lapped joints between rolls (if any) are transverse to the direction of flow with the overlapping in the direction of flow. All joints shall be lapped a minimum of twelve (12) inches.
7. Vehicles and equipment shall not be operated directly on the fabric. The full depth of riprap shall be in place before any equipment is allowed on the area.
8. Prior to placement of the drainage fabric, the surface to be covered shall be smooth, free of obstructions, and conform to the plan configuration.
9. Existing riprap that was removed shall be reset. Additional riprap that is required to complete the riprap installation to the Original Construction Plans configuration, limits and elevations shall be provided by the Contractor.
10. A factor of 1.4 tons/cu.yd. was used to convert Cu. Yds. to Tons.
11. Type B Drainage Fabric will be measured and paid for by the square yard of surface area of fabric accepted complete in place on the project. Measurement will not include fabric required for lapped seams or joints. All costs associated with preparing the area for the fabric and furnishing and installing the fabric shall be incidental to the contract unit price per square yard for Type B Drainage Fabric.
12. All costs associated with resetting the existing riprap that was removed and reset shall be incidental to the contract price per cubic yard for Place Riprap. Plan quantity will be paid for Place Riprap. All costs associated with furnishing and installing new Class C Riprap provided by the Contractor shall be incidental to the contract price per cubic yard for Class C Riprap.

ESTIMATE OF STRUCTURE QUANTITIES AND NOTES FOR

140' – 0" CONTINUOUS CONCRETE BRIDGE

Str. No. 10-146-229

AUGUST 2014 2 21

DESIGNED BY:	CK. DES. BY	DRAFTED BY	
RS BUTEi3LN	RS i3LNxxxx	RS	BRIDGE ENGINEER

CONTRACTOR FURNISHED BORROW

The Contractor shall provide a suitable site for Contractor furnished borrow material. The Contractor is responsible for obtaining all required permits and clearances for the borrow site. The borrow material shall be approved by the Engineer. Contractor furnished borrow will be measured.

Restoration of the Contractor furnished borrow site shall be the responsibility of the Contractor.

CONTROLLED DENSITY FILL

Controlled density fill shall be placed in the voids under the abutments per the plan details.

Controlled density fill shall be a flowable mortar material. Material and mixing shall be in accordance with the Section 462 of the Standard Specifications, except as modified below. The mix shall be as follows:

Mix Design:

Material	Rate per Cubic Yard
Portland Cement, Type II	100 Lb
Fine Aggregate	2,600 Lb
Coarse Aggregate	None
Water	60 Gal
Fly Ash, Type C	300 Lb

The fine aggregate shall be natural sand consisting of mineral aggregate particles conforming to the following gradation requirements:

Passing a 3/8 Inch Sieve	100%
Passing a No. 200 Sieve	0-10%

The mix shown above is designed to produce a minimum compressive strength of 100 psi. The Engineer may allow adjustments to the proportion of water at the site to provide the necessary consistency of the mix.

Controlled density fill shall be contained within the required limits with sandbags or other methods approved by the Engineer.

Cost for furnishing and installing the controlled density fill, including sandbags, labor, material, equipment and incidentals necessary to complete the work shall be included in the contract unit price per cubic yard for Controlled Density Fill.

The quantity included in the plans is only an estimate. Actual field conditions may vary. The quantity of Controlled Density Fill will be the quantity delivered and placed.

Do not place Controlled Density Fill during inclement weather, e.g. rain, when the subgrade is frozen, or when the subgrade contains an abnormal amount of moisture from recent rainfall as evidenced by standing water on the pavement or in joints or cracks. Do not place controlled Density Fill when ambient air temperature of 40° F or less is anticipated in the 24 hour period following proposed placement. Produce and deliver the flowable fill at a minimum temperature of 50° F. Protect flowable fill from freezing for a period of 36 hours after placement.

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	085-468	10	59

IMAGES
FOR
140’ – 0” CONTINUOUS CONCRETE BRIDGE

Str. No. 10-146-229

AUGUST 2014

4 21

DESIGNED BY:	CK. DES. BY	DRAFTED BY	
RS	RS	RS	
BUTEi3LN	i3LNxxxx		BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	085-468	11	59

IMAGES
FOR
140’ – 0” CONTINUOUS CONCRETE BRIDGE

Str. No. 10-146-229

AUGUST 2014

5 21

DESIGNED BY:	CK. DES. BY	DRAFTED BY:	
RS	RS	RS	
BUTEi3LN	i3LNxxx		BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	085-468	12	59

IMAGES
FOR
140’ – 0” CONTINUOUS CONCRETE BRIDGE

Str. No. 10-146-229

AUGUST 2014

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DESIGNED BY:	CK. DES. BY	DRAFTED BY:	
RS	RS	RS	
BUTEi3LN	i3LNxxx		BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	085-468	13	59

IMAGES
FOR
140’ – 0” CONTINUOUS CONCRETE BRIDGE

Str. No. 10-146-229

AUGUST 2014

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DESIGNED BY:	CK. DES. BY	DRAFTED BY:	
RS	RS	RS	
BUTEi3LN	i3LNxxx		BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	085-468	14	59

IMAGES
FOR
140’ – 0” CONTINUOUS CONCRETE BRIDGE

Str. No. 10-146-229

AUGUST 2014

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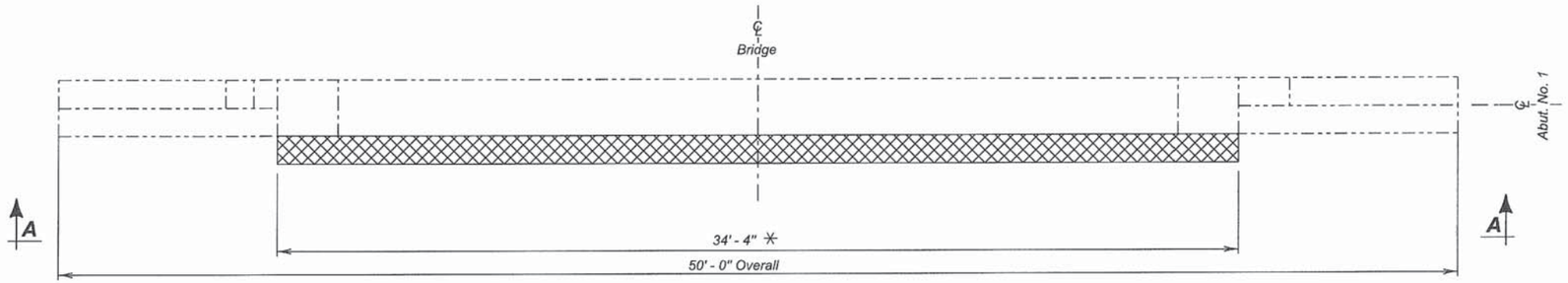
DESIGNED BY:	CK. DES. BY	DRAFTED BY:	
RS BUTEi3LN	RS i3LNxxx	RS	BRIDGE ENGINEER

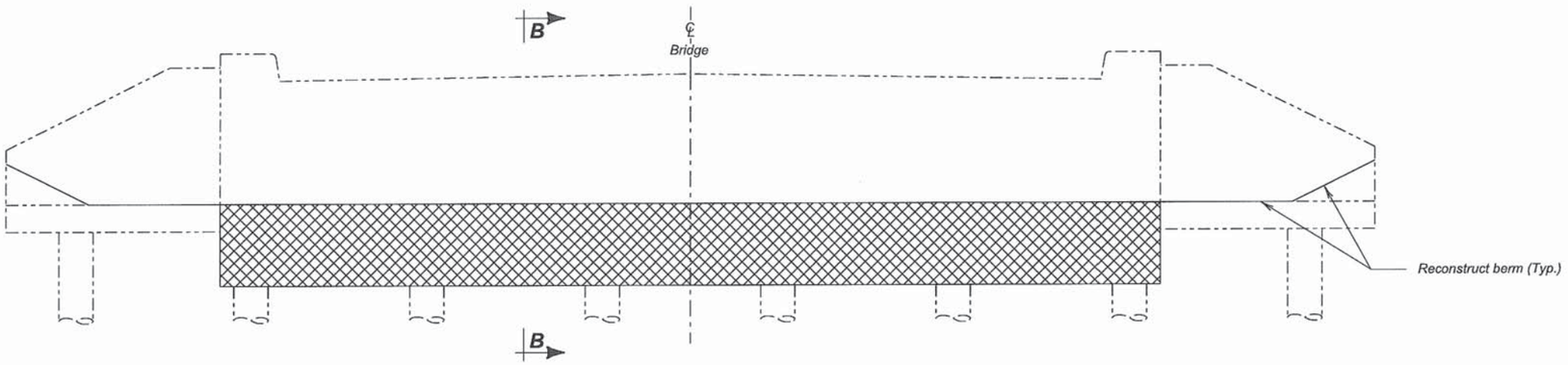
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	085-468	15	59



PLAN

Abutment No. 1 (Southwest) shown
Abutment No. 6 (Northeast) similar by rotation except no Controlled Density Fill

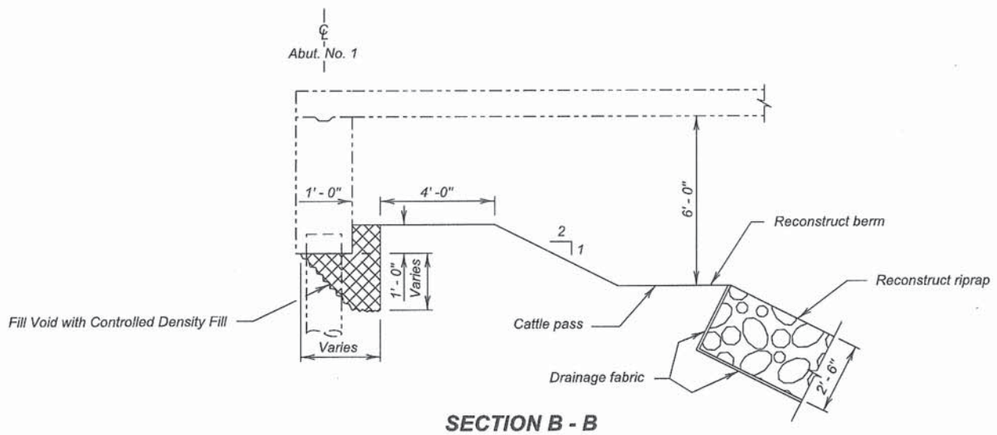
✳ *Adjust width as needed to fill void under abutment backwall and wingwalls.*



VIEW A - A

Controlled Density Fill

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Controlled Density Fill (Abut. 1)	Cu.Yd.	6.4

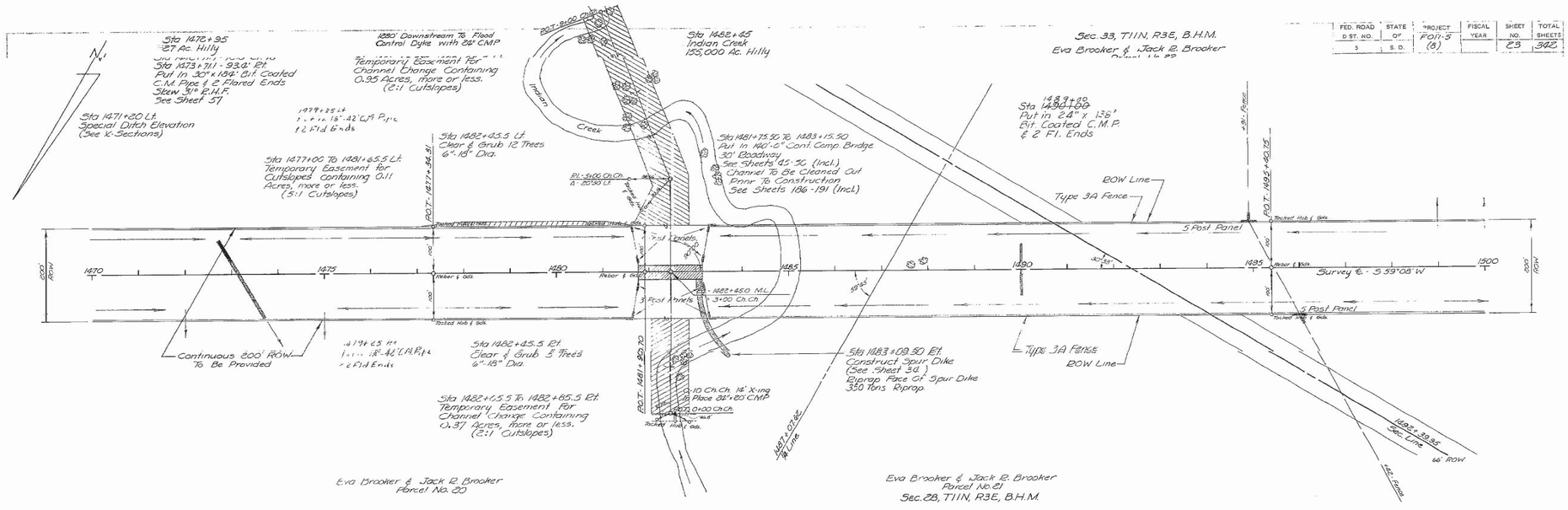


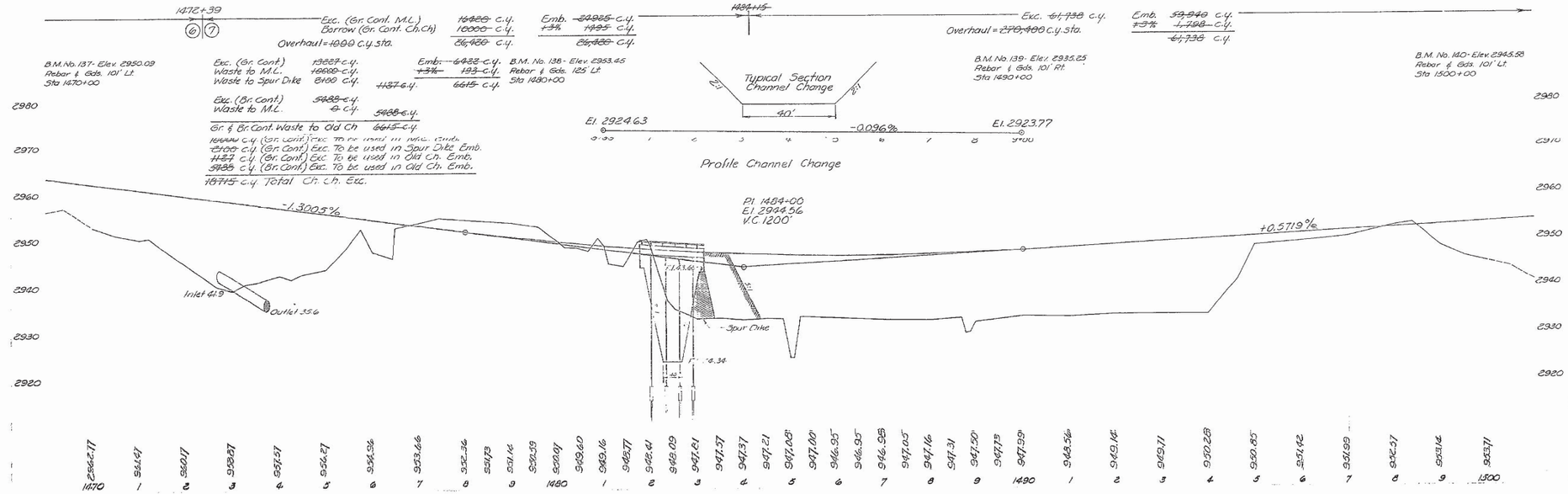
SECTION B - B

BRIDGE BERM DETAILS
FOR
140' - 0" CONT. CONCRETE BRIDGE
30' - 0" ROADWAY
OVER INDIAN CREEK
STR. NO. 10-146-229
0° SKEW
SEC. 28-T11N-R3E
13LN
BUTTE COUNTY
S. D. DEPT. OF TRANSPORTATION
AUGUST 2014

DESIGNED BY	DRAWN BY	CHECKED BY	
RS	RS	RS	
BUTET3LN	13LNXXXX		BRIDGE ENGINEER

FED. ROAD D ST. NO.	STATE OF S. D.	*PROJECT	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5		FOII-5 (8)		23	342





ORIGINAL CONSTRUCTION PLANS

FED. ROAD DIST. NO.	STATE	PROJECT NO.	SHEET NO.	TOTAL
5	S.D.	~~NH0085(37)72~~	~~16~~	~~111~~

085-468 17 59

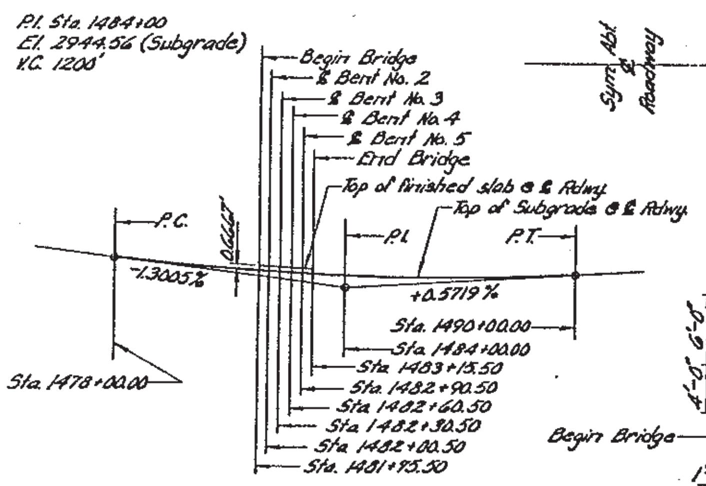
INDEX OF BRIDGE SHEETS—

Sheet No. 1 — General Drawing and Quantities
Sheet No. 2 — Subsurface Investigations
Sheet No. 3 — Details of Standard Superstructure **NCCS-30-00-209-1-2** (11-19-64)
Sheet No. 4 — Details of Standard Abutment **NCCS-30-00-209-2-2** (11-20-64)
Sheet No. 5 — Details of Bent
Sheet No. 6 — Details of Type "B" Steel Railing **NCS-RB-00-209-3-3** (3-5-63)

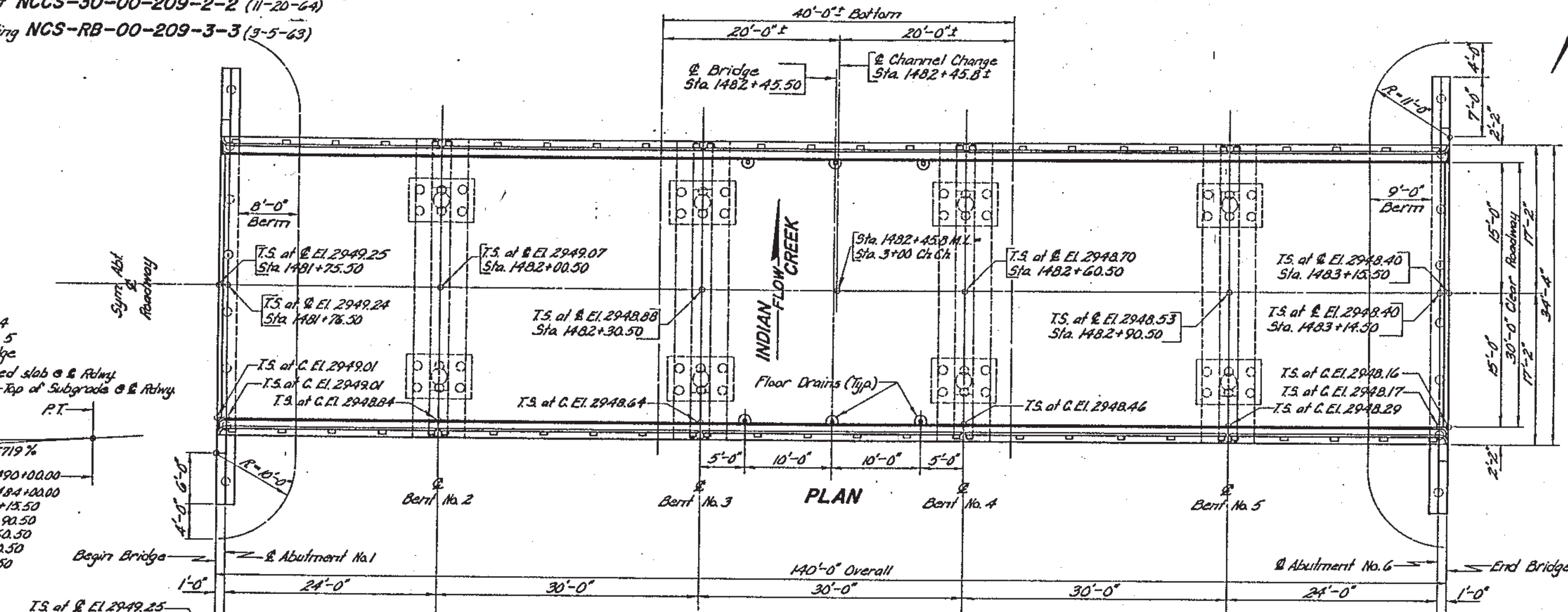
Q	5400 c.f.s.
A	1050 sq. ft.
V	5.1 f.p.s.

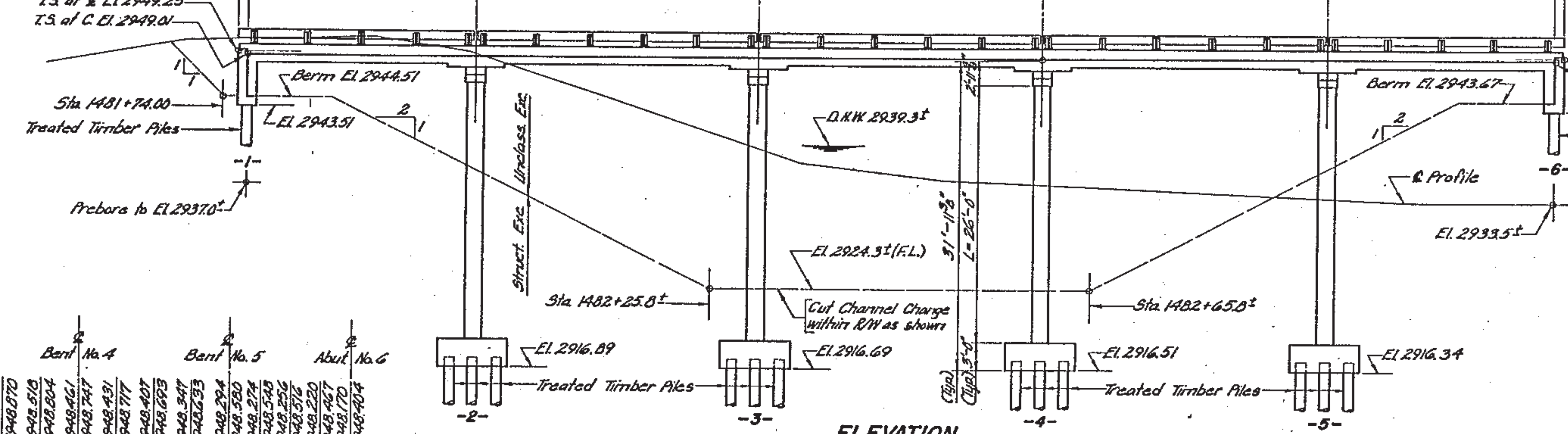
B.M. No. 138 - El. 2953.45
Iron Pin & Gds.
125' Lt. Sta. 1480+00

B.M. No. 139 - El. 2935.25
Iron Pin & Gds.
101' Rt. Sta. 1490+00

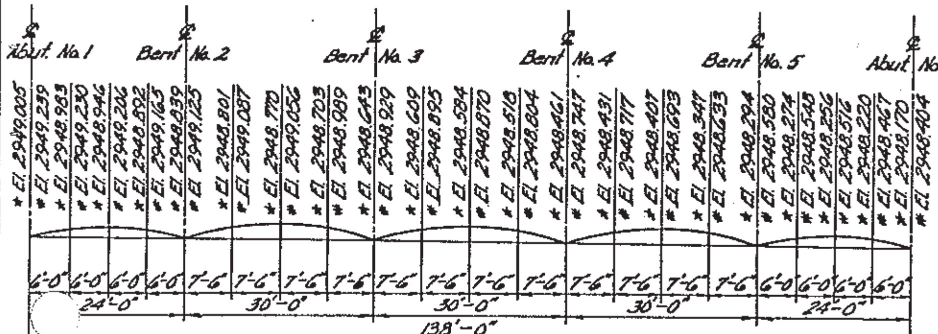


VERTICAL CURVE DATA





ELEVATION



CURB & ℄ ELEVATIONS

Elevations indicated with * are Top of Finished Slab at Curb and with * are Top of Finished Slab at Centerline of Roadway. Camber for Dead Load Deflection PLUS Plastic Flow, shown on Sheet No. 3 of Bridge Plans, have been included in the elevations shown above.

NOTE:—
T.S. at C. El. = Top of Slab at Curb Elevation.
T.S. at ℄ El. = Top of Slab at Centerline Elevation.

SPECIFICATION NOTE—

Use South Dakota Standard Specifications for Roads and Bridges, 1963 Edition, approved as Standard September 21, 1964, and Required Provisions, Supplemental Specifications and/or Special Provisions as included in the Proposal. All concrete shall be Class "A" (Type II Cement) with air entrainment.

GENERAL NOTES—

1. Design Specifications: A.A.S.H.O. Specifications for Highway Bridges, 1961, with Interim Specifications for 1961, 1962, and 1963.
2. See NOTES on Sheets No. 2 thru 6.
3. Place floor drains as shown in Plan (6 Required).
4. Longitudinal elements of the slab shall conform to the vertical curve.
5. Rail posts shall be vertical.
6. Prebored holes for piles at Abutments shall be backfilled with granular material acceptable to the ENGINEER and compacted as specified by the ENGINEER. The cost of granular material, in place, shall be included in the unit price bid for the piles.
7. The contractor shall have sufficient pile splice material on hand before pile driving is started. See Standard Plate No. 303 for splice details.
8. Bridge contractor shall furnish and install 1⅛" x 7½" sleeve nut units in wing walls as shown on Standard Plate No. 304.
9. In the event pile shoes are used, see Standard Plate No. 301 for details.

ORIGINAL CONSTRUCTION PLANS

ESTIMATED QUANTITIES

ITEM	Class "A" Concrete Cu. Yds.	Steel - Lbs. Reinf.	Steel - Lbs. Struct.	Type "B" Steel Railing - Lin. Ft.	Timber Piles - Lin. Ft. Treated Timber	Timber Piles - Lin. Ft. ϕ Test	Excavation - Cu. Yds. Struct.	Excavation - Cu. Yds. ΔUnclass.
Superstructure	190.0	52,687	108	282.3				
Abutment No. 1	17.9	2,150	380		7@25' = 175'	1@30' = 30'	14	
Bents No. 2, 3, 4, & 5	71.6	15,468			44@18' = 792'	4@25' = 100'	347	
Abutment No. 6	17.9	2,150	380		7@45' = 315'	1@50' = 50'	14	
Totals	297.4 297.21	72,455	868	282.3	1282	ϕ180	375	Δ —

ϕ One Treated Timber Test Pile shall be driven at Abutments No. 1 and No. 6 and at Bents No. 2, 3, 4, and 5 before the remaining piles are ordered.
Δ All Unclassified Excavation to be done by others.

	Str. Exc.	Tim. Piling	Tim Cutoff	Test Piling	Test Cutoff
Abut. 1	18.81	192.0	17.1	26.0	4.0
B 2	26.68	190.1	29.3	18.0	7.0
B 3	51.49	193.8	24.2	9.4	5.4
B 4	52.61	192.3	27.7	18.4	6.6
B 5	106.56	190.6	29.4	16.7	8.3

F.E. 1-11-66 R.D.V.

GENERAL DRAWING AND QUANTITIES
FOR
140'-0" CONTINUOUS CONCRETE BRIDGE
30'-0" ROADWAY

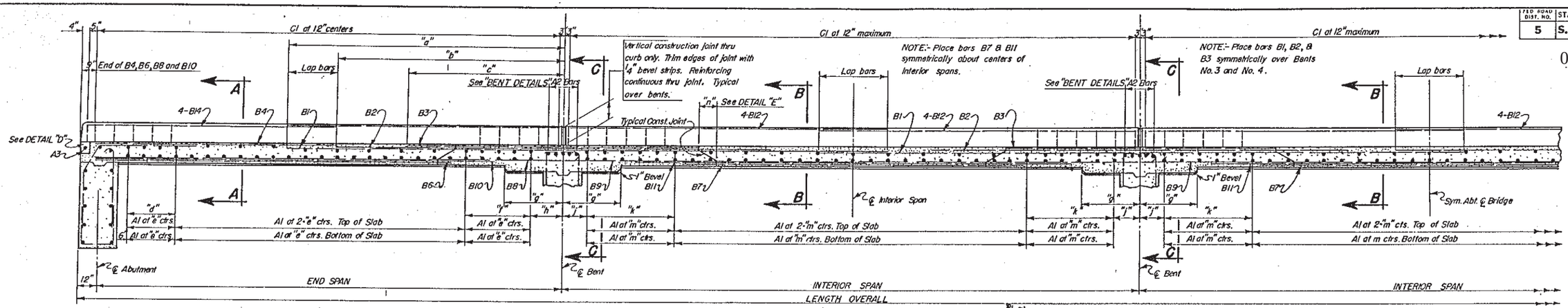
OVER INDIAN CREEK — SEC. 28-T11N-R3E
STA. 1481+75.50 TO 1483+15.50 — ~~F 011-5( )~~
STR. NO. 10-146-229 BUTTE COUNTY
SOUTH DAKOTA — HS20-44
DEPARTMENT OF HIGHWAYS
NOV. 1964 — 11 ~~5~~ OF ~~10~~ 21

-X020-

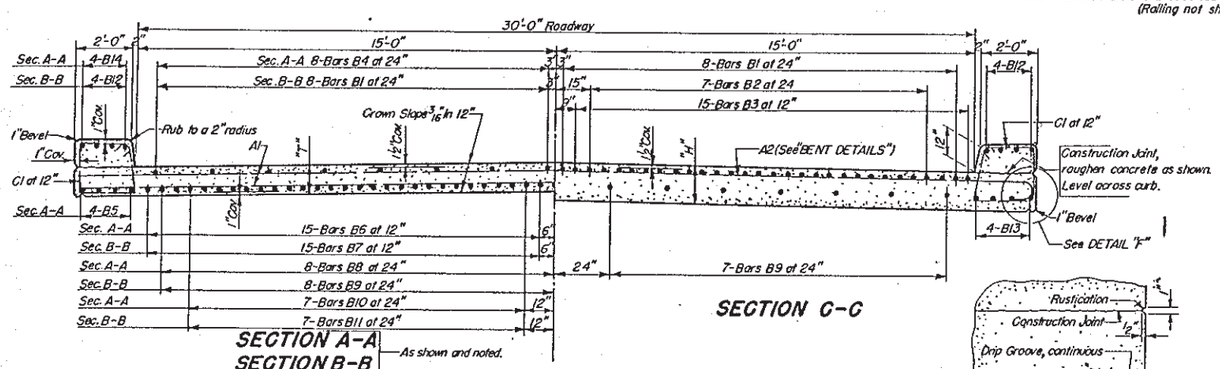
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
	L.G.	P.A.H.	[illegible]

FED. ROAD DIST. NO.	STATE	PROJECT NO.	SHEET NO.	TOT. SHTS.
5	S.D.	NHOOBS(37)72	17	111

085-468 18 59



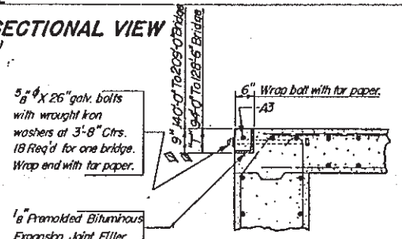
HALF LONGITUDINAL SECTIONAL VIEW
(Railing not shown)



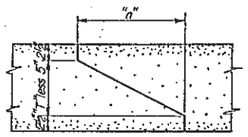
SECTION A-A
SECTION B-B

SECTION C-C

DETAIL "F"



DETAIL "D"



DETAIL "E"
(TYPICAL CONSTRUCTION JOINT)

—NOTES—

These notes cover Abutment, Superstructure, and Railing Details. The General Drawing for each structure will show spans, elevations, and other necessary notes and details.

DESIGN SPECIFICATIONS: A.A.S.H.O. Specifications for Highway Bridges, 1961, with Interim Specifications for 1961, 1962, 1963 and 1964.

PILING: See General Drawing for type and length of Abutment piling.

STRUCTURAL STEEL: All 5/8"ϕ bolts including washers, and all pile connections in Abutments, and all floor drains shall be paid for as Structural Steel.

REINFORCING STEEL: All Reinforcing Steel shall conform to A.S.T.M. Specifications A305 and A15 (Intermediate Grade)

CONCRETE: Class "A" Concrete shall develop a minimum allowable compressive strength of 4,000 p.s.i. at 28 days. All exposed concrete corners and edges shall be chamfered to a 3/4" bevel unless noted otherwise. If necessary to facilitate construction, transverse construction joints may be made at the quarter points of each and any span, adjacent to interior bents. All costs for expansion joint filler and tar paper shall be included in the unit price bid per cu. yd. for Class "A" Concrete.

DESIGN DATA: Design Loading: HS20-44 A.A.S.H.O. Unit stresses: Concrete f_c = 1600 p.s.i., n=8; Reinforcing Steel f_s = 20,000 p.s.i. (Int. Grade Steel). Equivalent fluid pressure of earth at 40# /sq. ft. Minimum Pile Loading = 24 tons for Timber Piling and 45 tons for BBP36 Steel Bearing Piles (values for one pile).

SLAB DATA

REINFORCING SCHEDULE

LENGTH OVERALL	END SPAN	INTERIOR SPAN	A1 No.	A1 Size	A1 Length	A2	A3 No.	A3 Size	A3 Length	B1 No.	B1 Size	B1 Length	B2 No.	B2 Size	B2 Length	B3 No.	B3 Size	B3 Length	B4 No.	B4 Size	B4 Length	B5 No.	B5 Size	B5 Length	B6 No.	B6 Size	B6 Length	B7 No.	B7 Size	B7 Length	B8 No.	B8 Size	B8 Length	B9 No.	B9 Size	B9 Length	B10 No.	B10 Size	B10 Length	B11 No.	B11 Size	B11 Length	B12 No.	B12 Size	B12 Length	B13 No.	B13 Size	B13 Length	B14 No.	B14 Size	B14 Length	Cl No.	Cl Size	Cl Length	Cl Type
94'-0"	16'	20'	152	5	33'-9"		2	5	29'-9"	64	8	22'-6"	56	8	17'-0"	120	7	10'-0"	32	7	8'-0"	16	6	16'-9"	60	8	14'-0"	90	8	13'-9"	30	8	16'-3"	45	8	20'-0"	28	7	15'-3"	42	7	17'-0"	32	6	22'-6"	24	6	20'-0"	16	6	8'-6"	198	4	8'-0"	T1
105'-6"	18'	22'-6"	176							8		24'-0"		8	18'-0"		8	11'-9"		8	15'6"		7	18'-9"		8	16'-0"		8	16'-0"		8	18'-3"		8	22'-6"		7	16'-9"		7	19'-0"		7	24'-0"		7	22'-6"		7	10'-0"	218		8'-0"	
117'-0"	20'	25'	196							8		26'-0"		8	19'-6"		8	13'-6"		7	11'-0"		7	20'-9"		8	16'-6"		8	16'-0"		8	20'3"		8	25'-0"		8	18'-6"		8	20'-6"		7	25'-0"		7	11'-6"	244		8'-3"	
128'-6"	22'	27'-6"	215							9		28'-0"		8	20'-0"		8	14'-6"		8	12'-6"		8	22'-9"		8	17'-6"		8	17'-0"		9	22'-3"		9	27'-6"		8	19'-0"		8	21'-0"		8	28'-0"		8	27'-6"		8	13'-0"	264		8'-3"	
140'-0"	24'	30'	242							9		31'-0"		9	22'-6"		8	15'-0"		8	12'-6"		8	24'-9"		8	18'-6"		8	17'-6"		9	24'-3"		9	30'-0"		9	20'-9"		9	22'-6"		8	31'-0"		8	30'-0"		8	13'-0"	290		8'-3"	
151'-6"	26'	32'-6"	261							9		34'-0"		9	24'6"		9	17'-0"		8	15'-0"		9	26'-9"		9	20'-6"		9	20'-0"		9	26'3"		9	32'-6"		8	21'-6"		8	23'-0"		9	32'-6"		9	30'-0"		8	15'-6"	310		8'-6"	
163'-0"	28'	35'	281							10		35'-0"		9	24'-6"		9	18'-0"		8	15'-0"		9	28'-9"		9	21'-6"		9	20'-6"		9	26'3"		9	35'-0"		9	23'-6"		9.	24'-6"		9	35'-0"		9	35'-0"		8	15'-6"	336		8'-6"	
174'-6"	30'	37'-6"	340							10		36'6"		10	26'-0"		9	17'-0"		9	30'-9"		9	23'-0"		9	20'-6"		9	20'-6"		10	30'3"		10	37'-6"		9	24'-6"		9	25'-0"		9	36'-6"		9	37'-6"		8	17'-6"	356		8'-9"	
186'-0"	32'	40'	362							10		39'-0"		10	27'-6"		10	19'-6"		9	17'-6"		10	32'-9"		9	23'-6"		9	20'-0"		10	32'-3"		10	40'-0"		10	26'-0"		10	39'-0"		10	40'-0"		8	18'-0"	382		8'-9"	
197'-6"	34'	42'-6"	386							10		40'-0"		10	30'-0"		10	23'-0"		9	19'-6"		10	34'-9"		9	25'-0"		9	21'-6"		10	34'3"		10	42'-6"		10	27'-6"		10	27'-0"		10	40'-6"		10	42'-6"		8	20'-0"	402		9'-0"	T1
209'-0"	36'	45'	410	5	33'-9"		2	5	29'-9"	64	10	42'-6"	56	10	30'-0"	120	10	23'-0"	32	9	21'-0"	16	11	36'-9"	60	10	27'-0"	90	10	24'-6"	30	10	36'3"	45	10	45'-0"	28	9	29'-0"	42	9	28'-6"	32	11	42'-6"	24	11	45'0"	16	8	21'-6"	428	4	9'-0"	T1

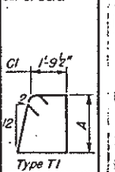
See "BENT DETAILS" for Number, Length, Size and Quantity.

DIMENSIONS

LENGTH OVERALL	"f"	"H"	"a"	"b"	"c"	"d"	"e"	"f"	"g"	"h"	"j"	"k"	"m"	"n"	A
94'-0"	9 1/4"	12 1/2"	11'-0"	8'-3"	4'-9"	1'-8"	10"	1'-8"	2'-0"	1'-2"	1'-9"	2'-9"	11"	7 3/4"	
105'-6"	9 3/4"	13 1/4"	11'-3"	9'-9"	6'-3"	1'-8"	10"	1'-8"	2'-3"	1'-6"	1'-2"	2'-9"	11"	8 1/2"	
117'-0"	10 1/4"	14"	12'-0"	10'6"	7'-0"	2'-6"	10"	2'-6"	2'-6"	1'-10"	1'-6"	3'-8"	11"	9 1/2"	
128'-6"	10 3/4"	14 3/4"	12'-6"	11'-0"	7'-6"	2'-6"	10"	3'-4"	2'-9"	1'-4"	1'-10"	3'-8"	11"	10 1/2"	
140'-0"	11"	15"	14'-3"	11'-9"	8'-0"	2'-6"	10"	3'-4"	3'-0"	1'-8"	1'-3"	4'-7"	11"	10 3/4"	
151'-6"	11 3/4"	16"	16'-0"	12'-9"	9'-0"	3'-4"	10"	3'-4"	3'-3"	1'-2"	1'-7"	4'-7"	11"	1'-0 1/4"	
163'-0"	12 1/2"	17"	15'-9"	12'-9"	9'-3"	4'-2"	10"	4'-2"	3'-6"	1'-6"	1'-11"	5'-6"	11"	1'-1 1/2"	
174'-6"	13 1/2"	17 3/4"	16'-0"	13'-6"	9'-6"	4'-6"	9"	4'-6"	3'-9"	1'-6"	1'-3"	5'-10"	10"	1'-2 3/4"	
186'-0"	13 1/2"	18 1/4"	17'-3"	14'-3"	10'-3"	4'-6"	9"	5'-3"	4'-0"	1'-3"	1'-8"	6'-6"	10"	1'-3 1/4"	
197'-6"	14 1/4"	19 1/4"	17'-6"	15'-0"	11'-9"	4'-6"	9"	5'3"	4'3"	1'-9"	1'-3"	6'-6"	10"	1'-4 3/4"	
209'-0"	15"	20 1/4"	18'-0"	15'3"	11'-9"	6'-0"	9"	6'-0"	4'-6"	1'-6"	1'-8"	7'-6"	10"	1'-6"	

BAR BENDS

NOTE. All dimensions are out to out of bars.



Type T1

ESTIMATED QUANTITIES

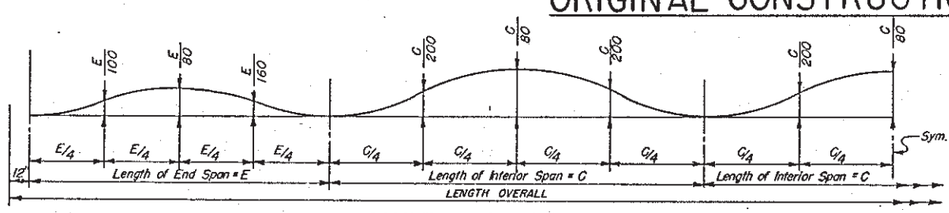
TWO ABUTMENTS

LENGTH OVERALL	Class "A" Concrete * Cu. Yds.	Reinforcing Steel Lbs.	TIMBER PILES Number of Piles	TIMBER PILES Struct. Steel Lbs.	STEEL PILES Number of Piles	STEEL PILES Struct. Steel Lbs.
94'-0"	35.8	4300	14	664	10	250
105'6"			14	664	10	250
117'-0"			14	664	10	250
128'-6"			16	760	10	250
140'0"			16	760	10	250
151'-6"			18	760	10	250
163'-0"			18	854	12	300
174'6"			18	854	12	300
186'-0"			20	950	12	300
197'6"			20	950	12	300
209'-0"	35.8	4300	20	950	12	300

SLABS & CURBS

LENGTH OVERALL	Class "A" Concrete Cu. Yds.	Reinforcing Steel Lbs.	5/8"ϕ Bolts	Number of Floor Drains	Structural Steel Lbs.
94'-0"	107.8	29,826	18	20	216
105'6"	127.5	35,298		26	275
117'-0"	148.4	39,487		26	284
128'-6"	170.1	46,705		30	330
140'0"	190.0	52,687		30	334
151'-6"	218.5	61,680		36	410
163'-0"	248.9	68,862		36	426
174'6"	276.7	77,107		36	438
186'-0"	305.0	87,556		40	494
197'6"	340.5	94,045		46	583
209'-0"	378.0	103,851	18	46	605

* Includes slabs and curbs directly over abutment.



CAMBER DIAGRAM

Camber is calculated for dead load plus plastic flow. Camber is calculated thus using the 186'-0" Bridge as an illustration: E=32' and C=40'; C/80=40/80=1/2, provide 1/2" camber at center of interior spans. The values obtained for camber shall be added to the proposed grade elevations of the respective stations to establish the elevations of the top of the finished roadway slab.

ORIGINAL CONSTRUCTION PLANS

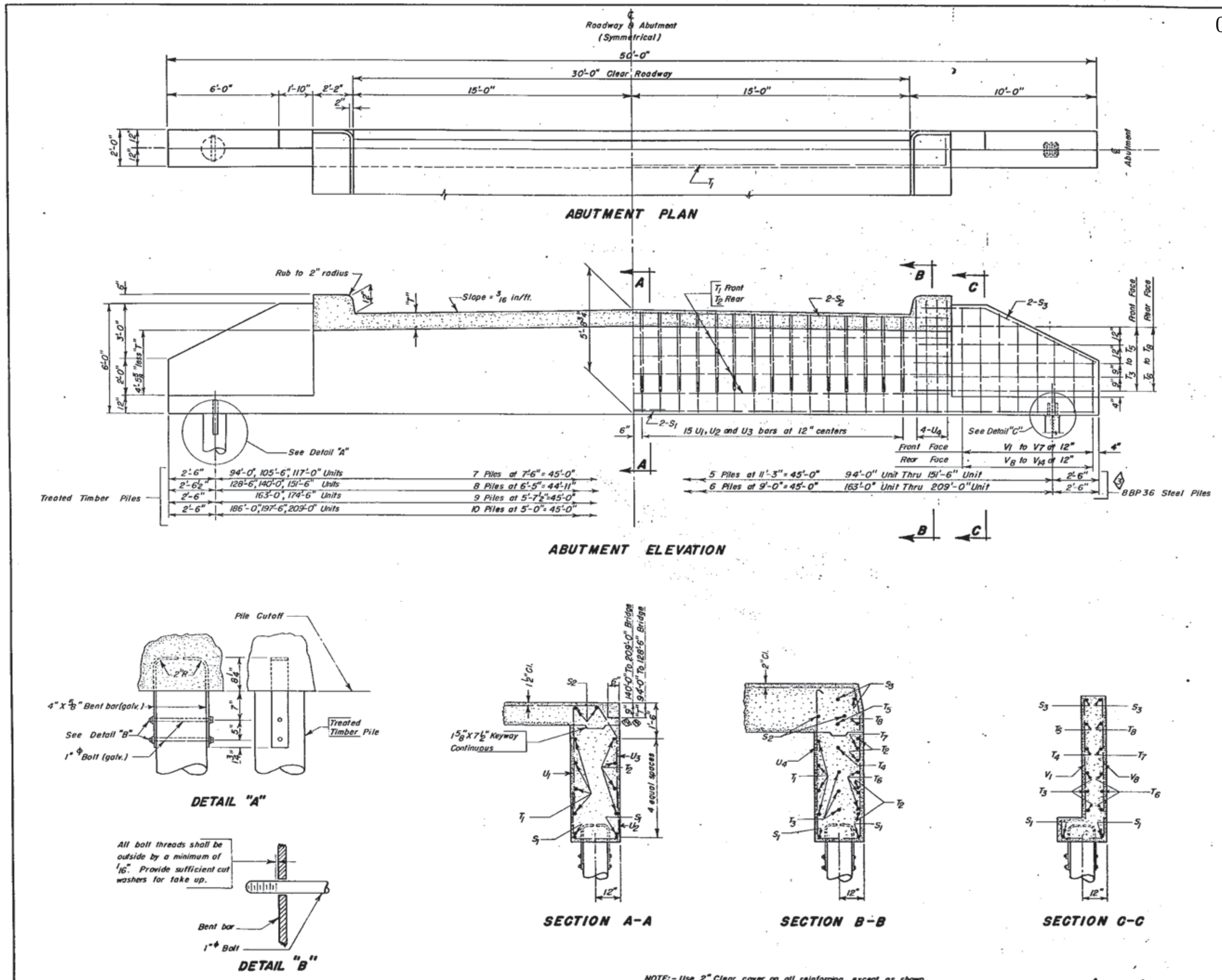
DETAILS OF STANDARD SUPERSTRUCTURE
FOR
5-SPAN CONTINUOUS
CONCRETE SLAB BRIDGES
30'-0" ROADWAY
94'-0" TO 209'-0" OVERALL LENGTH
STR. NO. 10-146-229 SOUTH DAKOTA
DEPARTMENT OF HIGHWAYS
JUNE 1963 12 (6) OF 21 (10)

(2) Rev. for 1964 A.A.S.H.O. Interim Specs. (11-19-64) R.C.M.
(1) Rev: 8-14-64 (GLS)

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
C.H.J./M.B.S.	J. L. H.	R.C.M.	BRIDGE ENGR.

NCCS-30-00-209-1-2

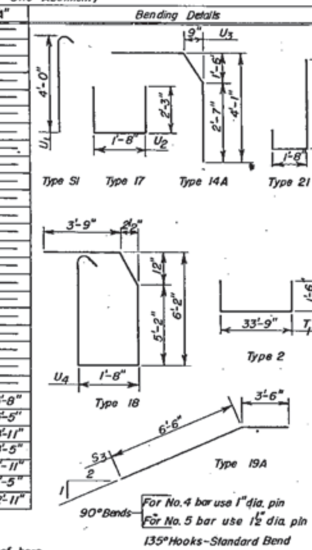
FED. ROAD DIST. NO.	STATE		FISCAL YEAR	SHEET NO.	TOTAL
5	S.D.				

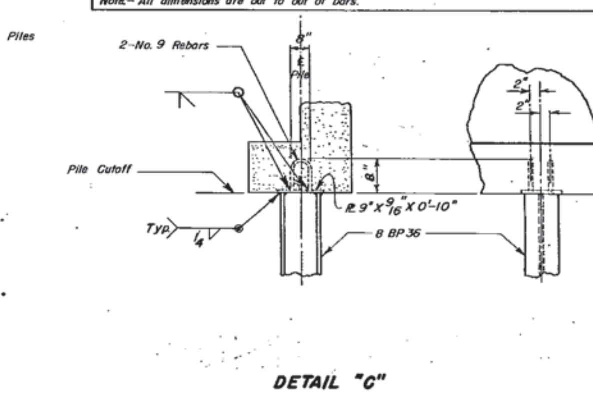


REINFORCING SCHEDULE
(For One Abutment)

MK	No.	Size	Length	Type	"A"
S_1	4	9	26'-6"	Str.	—
*S_2	2	9	34'-0"	Str.	—
S_3	4	9	10'-0"	19A	—
T_1	4	5	36'-9"	2	—
T_2	4	5	34'-0"	Str.	—
T_3	6	4	9'-9"	Str.	—
T_4	2	4	7'-9"	Str.	—
T_5	2	4	5'-9"	Str.	—
T_6	6	5	10'-0"	Str.	—
T_7	2	5	8'-0"	Str.	—
T_8	2	5	6'-0"	Str.	—
U_1	30	4	4'-6"	S1	—
U_2	30	4	6'-3"	17	—
U_3	30	6	9'-6"	14A	—
U_4	8	6	18'-6"	18	—
V_1	4	4	5'-0"	Str.	—
V_2	2	4	4'-6"	Str.	—
V_3	2	4	4'-0"	Str.	—
V_4	2	4	3'-6"	Str.	—
V_5	2	4	3'-0"	Str.	—
V_6	2	4	2'-6"	Str.	—
V_7	2	4	2'-0"	Str.	—
V_8	4	4	8'-0"	21	5'-8"
V_9	2	4	7'-9"	21	5'-5"
V_{10}	2	4	7'-3"	21	4'-11"
V_{11}	2	4	6'-9"	21	4'-5"
V_{12}	2	4	6'-3"	21	3'-11"
V_{13}	2	4	5'-9"	21	3'-5"
V_{14}	2	4	5'-3"	21	2'-11"

*Bend in field if necessary.
Note:- All dimensions are out to out of bars.





ORIG. CONSTR. PLANS
STR. NO. 10-146-229

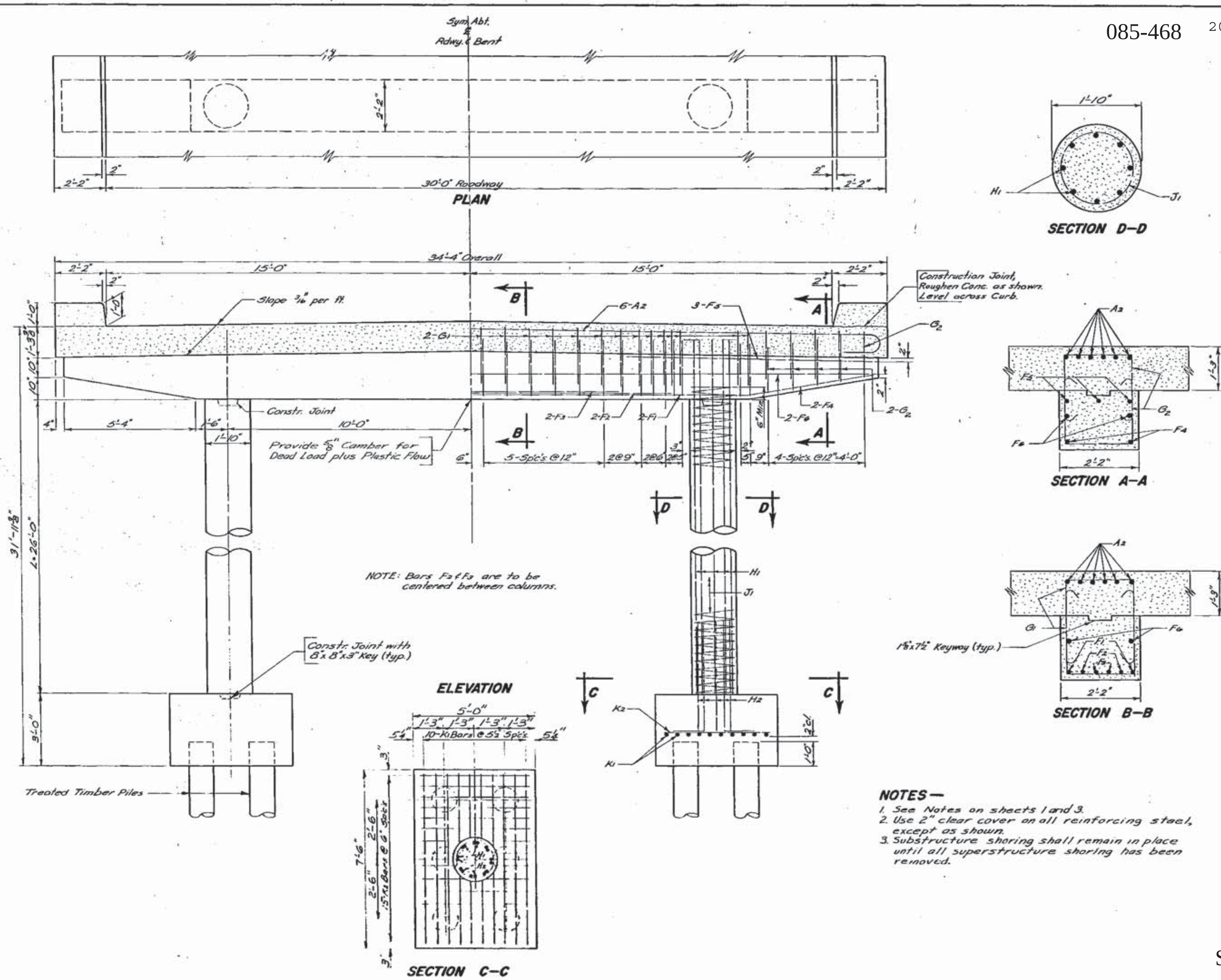
DETAILS OF STANDARD ABUTMENT
FOR
5-SPAN CONTINUOUS
CONCRETE SLAB BRIDGES
30'-0" ROADWAY
94'-0" TO 209'-0" OVERALL LENGTH
SOUTH DAKOTA
DEPARTMENT OF HIGHWAYS
JULY 1963 HS20-44

③ Remove ① (11-20-64) M.V.W.
③ Rev. for 1964 A.A.S.H.O. Interim Specs (11-19-64) R.C.M.
② Rev: 8-14-64 (GLS)
① Rev. Note: 12-20-63 (R.C.M.)

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
CHJ./M.B.S.	[illegible]	R.C.M.	[illegible] BRIDGE ENGINEER

NCCS-30-00-209-2-2
16-391/392/398/399/402

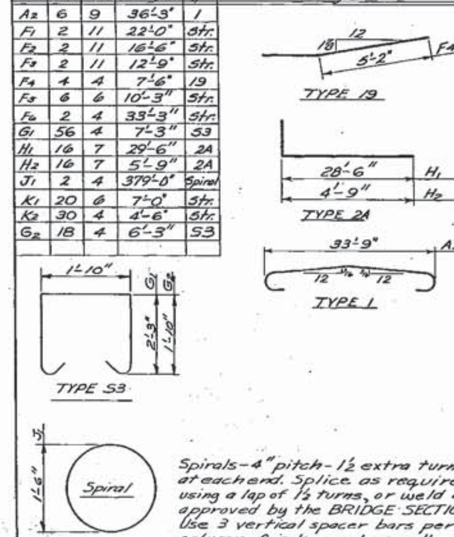
FED. ROAD DIST. NO.	STATE		FISCAL YEAR	SHEET NO.	TOTAL
5	S.D.	~~F00S (17)58~~		~~29~~	~~51~~



REINFORCING SCHEDULE
(For One Bent)

Mk.	No.	Size	Length	Type
A_2	6	9	36'-3"	1
F_1	2	11	22'-0"	Str.
F_2	2	11	16'-6"	Str.
F_3	2	11	12'-9"	Str.
F_4	4	4	7'-6"	19
F_5	6	6	10'-3"	Str.
F_6	2	4	33'-3"	Str.
G_1	56	4	7'-3"	S3
H_1	16	7	29'-6"	2A
H_2	16	7	5'-9"	2A
J_1	2	4	379'-0"	Spiral
K_1	20	6	7'-0"	Str.
K_2	30	4	4'-6"	Str.
G_2	18	4	6'-3"	S3

Bending Details



Spirals–4" pitch–1½ extra turns at each end. Splice as required, using a lap of 1½ turns, or weld as approved by the BRIDGE SECTION. Use 3 vertical spacer bars per column. Spirals may be smooth bars.

Note: All dimensions are out to out of bars.

ESTIMATED QUANTITIES
(For One Bent)

ITEM	UNIT	QUANTITY
Class "A" Concrete	Cu. Yds.	17.9
Reinforcing Steel	Lbs.	Δ 3867
Structure Exc. per ft. depth	Cu. Yds.	6.22

Δ Includes 120 lbs. for spacer bars. Each spacer bar is computed at ¾ Lbs. per Lin. Ft., regardless of type furnished.

NOTES—

1. See Notes on sheets 1 and 3.
2. Use 2" clear cover on all reinforcing steel, except as shown.
3. Substructure shoring shall remain in place until all superstructure shoring has been removed.

ORIG. CONSTR. PLANS
STR. NO. 10-146-229

DETAILS OF BENT
FOR
140'-0" CONTINUOUS CONCRETE BRIDGE
30'-0" ROADWAY
OVER INDIAN CREEK SEC. 28–T11N–R3E
STA. 1481+75.50 TO 1483+15.50 ~~F0H–5( )~~
BUTTE COUNTY
SOUTH DAKOTA HS20–44
DEPARTMENT OF HIGHWAYS

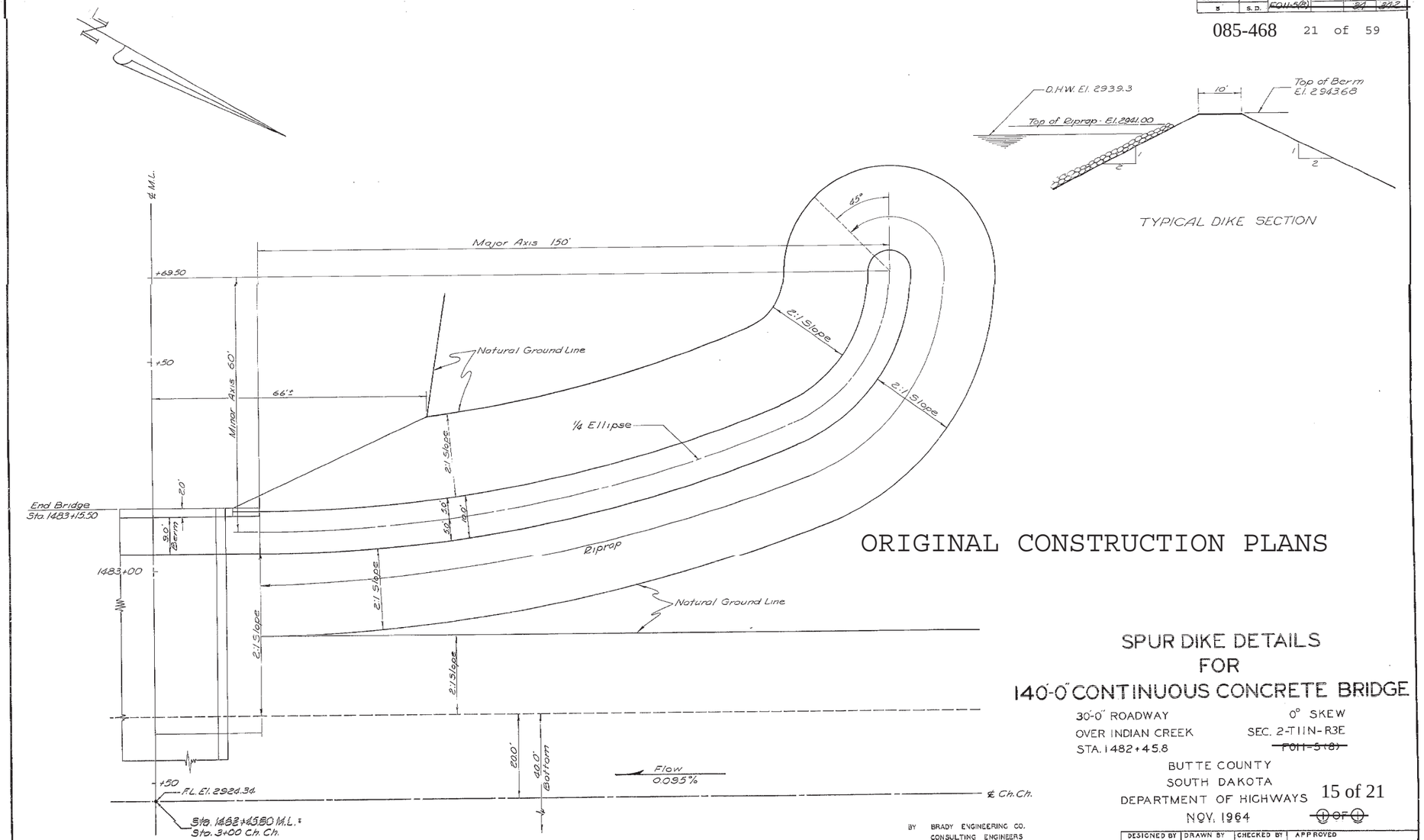
NOV. 1964 ~~5~~ OF ~~6~~

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
S.A.I.L.	[illegible]	I.A.H.	BRIDGE ENGINEER

10-391/394/398/397/... 322

FED. ROAD DIST. NO.	STATE OF	PROJECT	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	S. D.	FOII-5(8)		21	302

085-468 21 of 59



TYPICAL DIKE SECTION

ORIGINAL CONSTRUCTION PLANS

SPUR DIKE DETAILS FOR 140'-0" CONTINUOUS CONCRETE BRIDGE

30'-0" ROADWAY
OVER INDIAN CREEK
STA. 1482+45.8

0° SKEW
SEC. 2-T11N-R3E
~~FOII-5(8)~~

BUTTE COUNTY
SOUTH DAKOTA
DEPARTMENT OF HIGHWAYS
NOV. 1964

15 of 21

BY BRADY ENGINEERING CO.
CONSULTING ENGINEERS
SPEARFISH, SOUTH DAKOTA

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
W.D.C.	S.C.S.	F.R.B.	BRIDGE ENGINEER

FED. HWY. ADMIN. NO.	STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
8	S.D.	~~NH 0085(00)172~~	~~10~~	~~15~~

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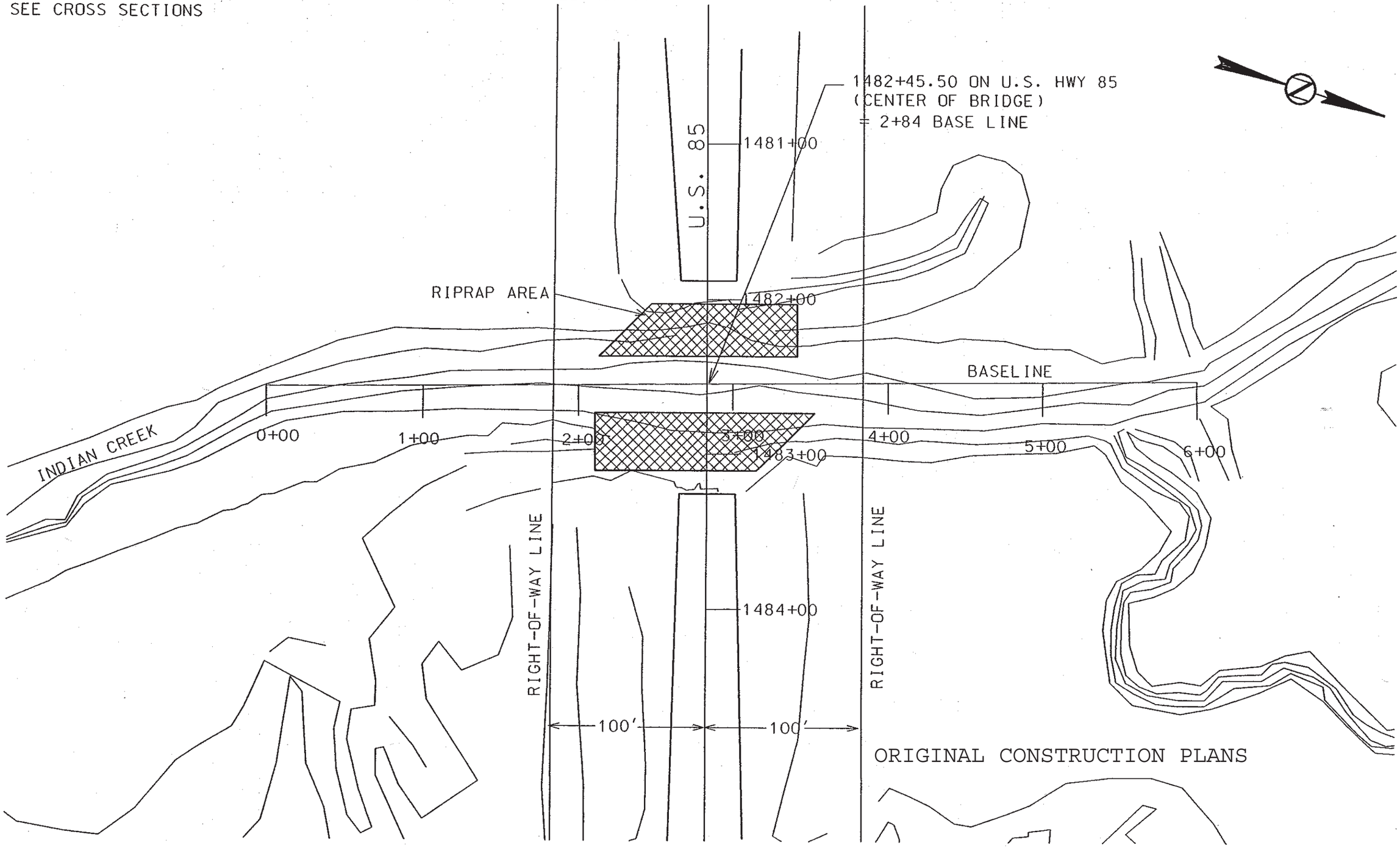
STA 2+14 TO STA 3+54 LT. & RT.
(BASELINE STATIONING)
RESTORE BERM
SEE CROSS SECTIONS

STA 2+14 TO STA 3+54 LT. & RT.
(BASELINE STATIONING)
INSTALL RIPRAP



ORIGINAL CONSTRUCTION PLANS

L20, J
$ LOAD 273IBG.DGN
$ G
IPARM
IPARM

DRAWN BY: DATE:
CHECKED BY: DATE:

FED.HWY. ADMIN.NO.	STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
8	S.D.	~~NH 0085(00)72~~	~~11~~	~~15~~

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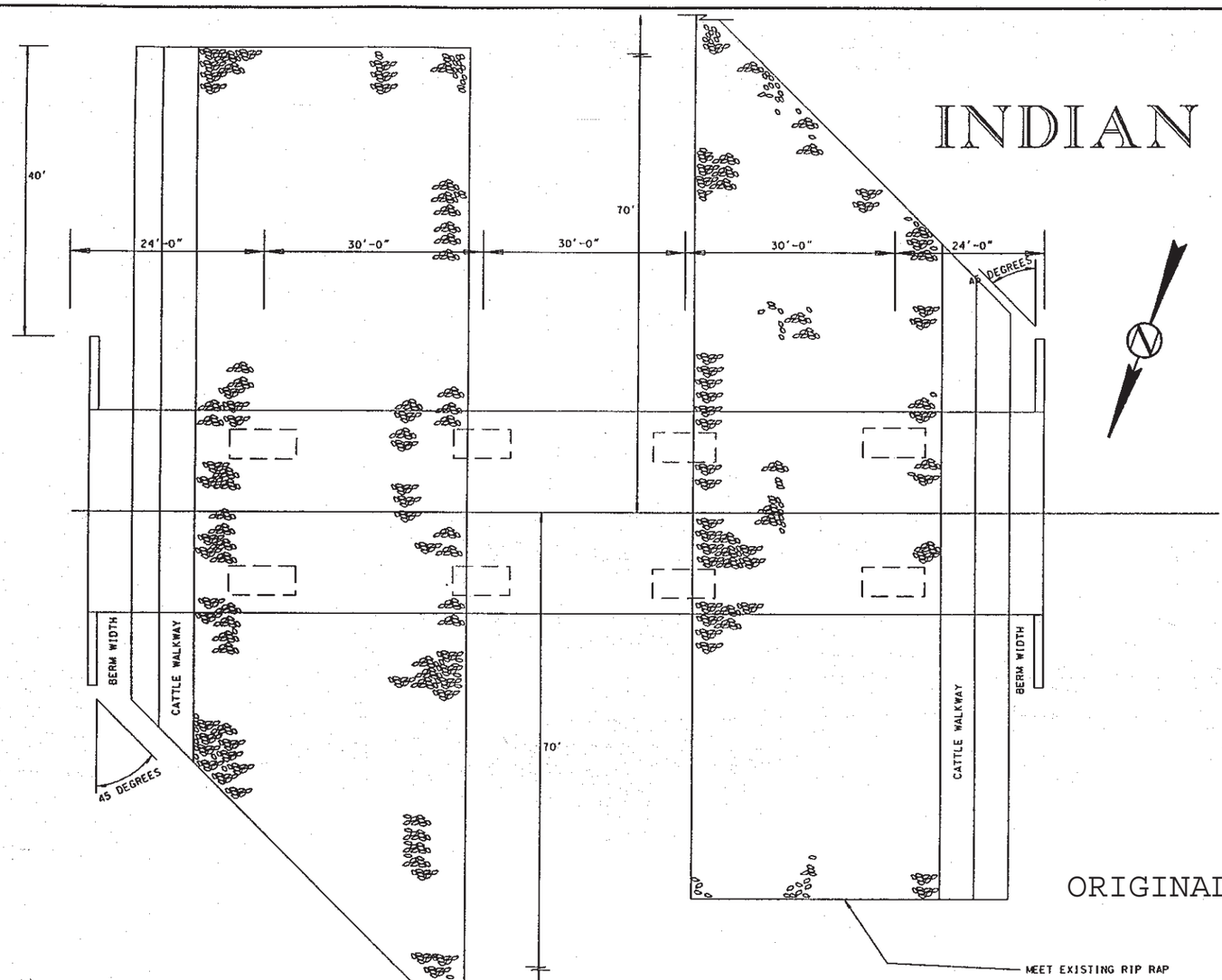
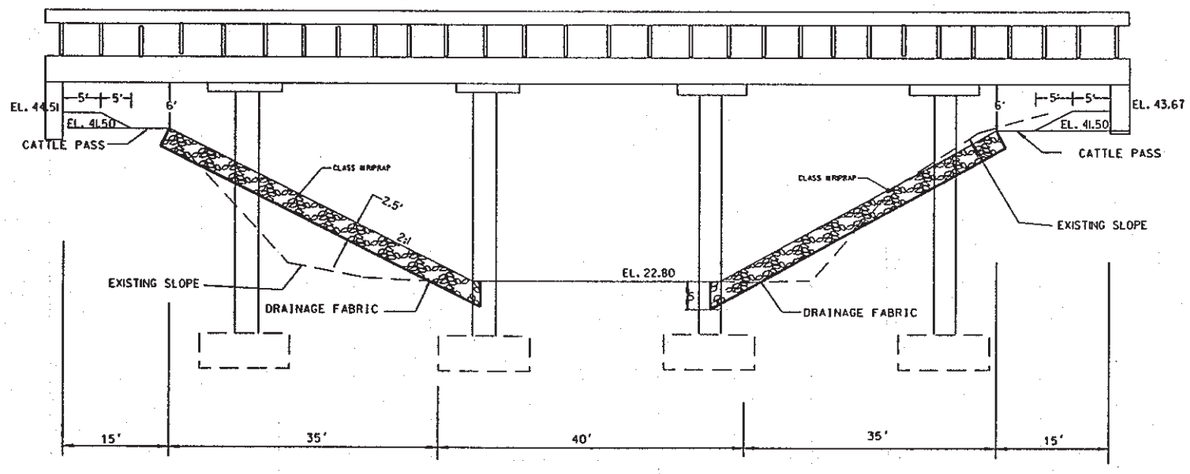
INDIAN CREEK



ORIGINAL CONSTRUCTION PLANS



RIP RAP DETAILS
140'-0" CONTINUOUS CONCRETE BRIDGE

ON U.S. 85 — 30' - 0" ROADWAY

OVER INDIAN CREEK — SEC. 28 - T11N - R3E

STA 1481+75.50 TO 1483+15.50 — STR. NO. 10-146-229

BUTTE COUNTY
SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION

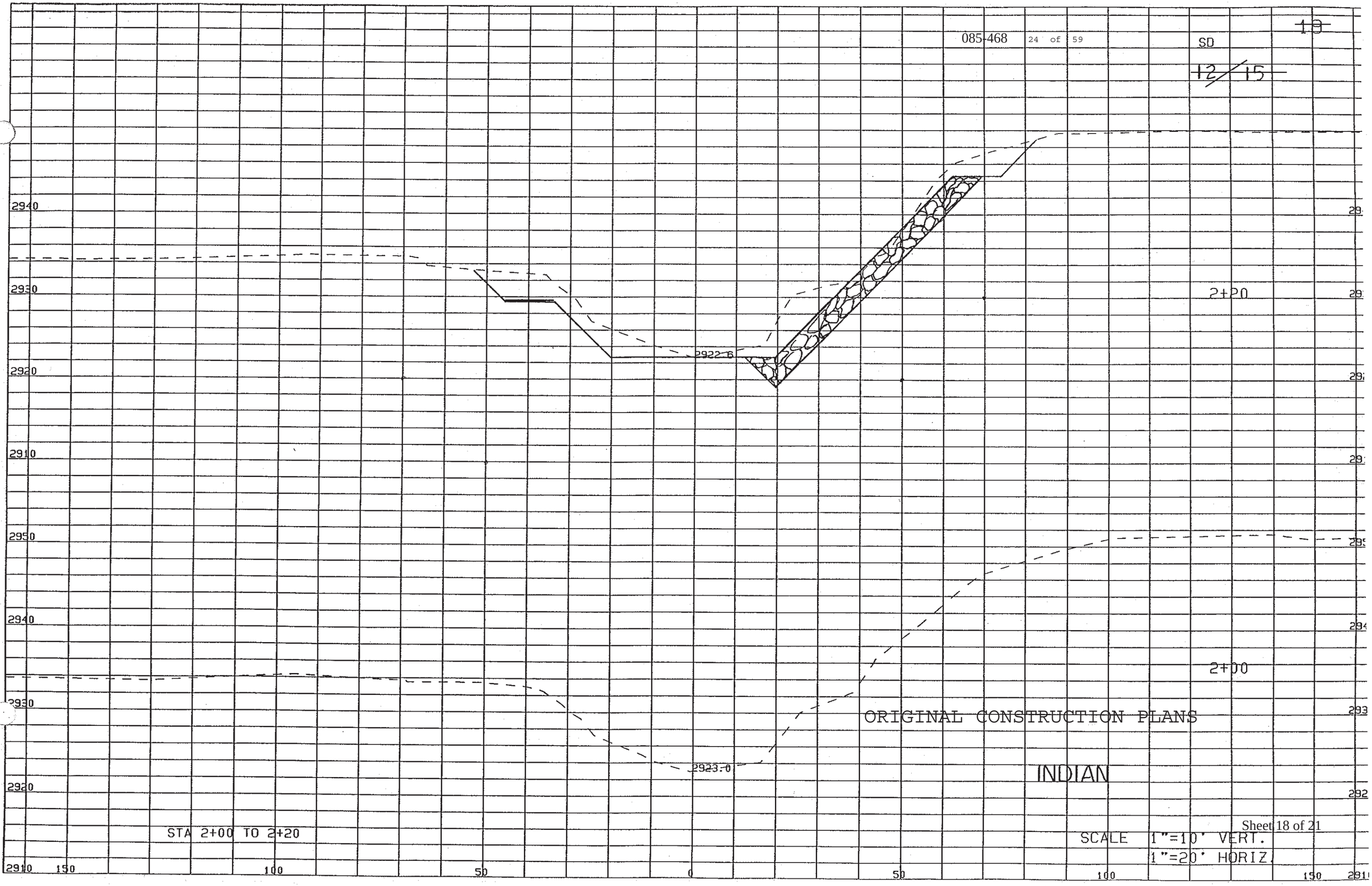
SHEET 17 OF 21 SHEETS

DRAWN BY:
CHECKED BY:
DATE:
DATE:
IPARM
IPARM

~~19~~

SD

~~12/15~~



STA 2+00 TO 2+20

ORIGINAL CONSTRUCTION PLANS

INDIAN

SCALE 1"=10' VERT.
1"=20' HORIZ.

20

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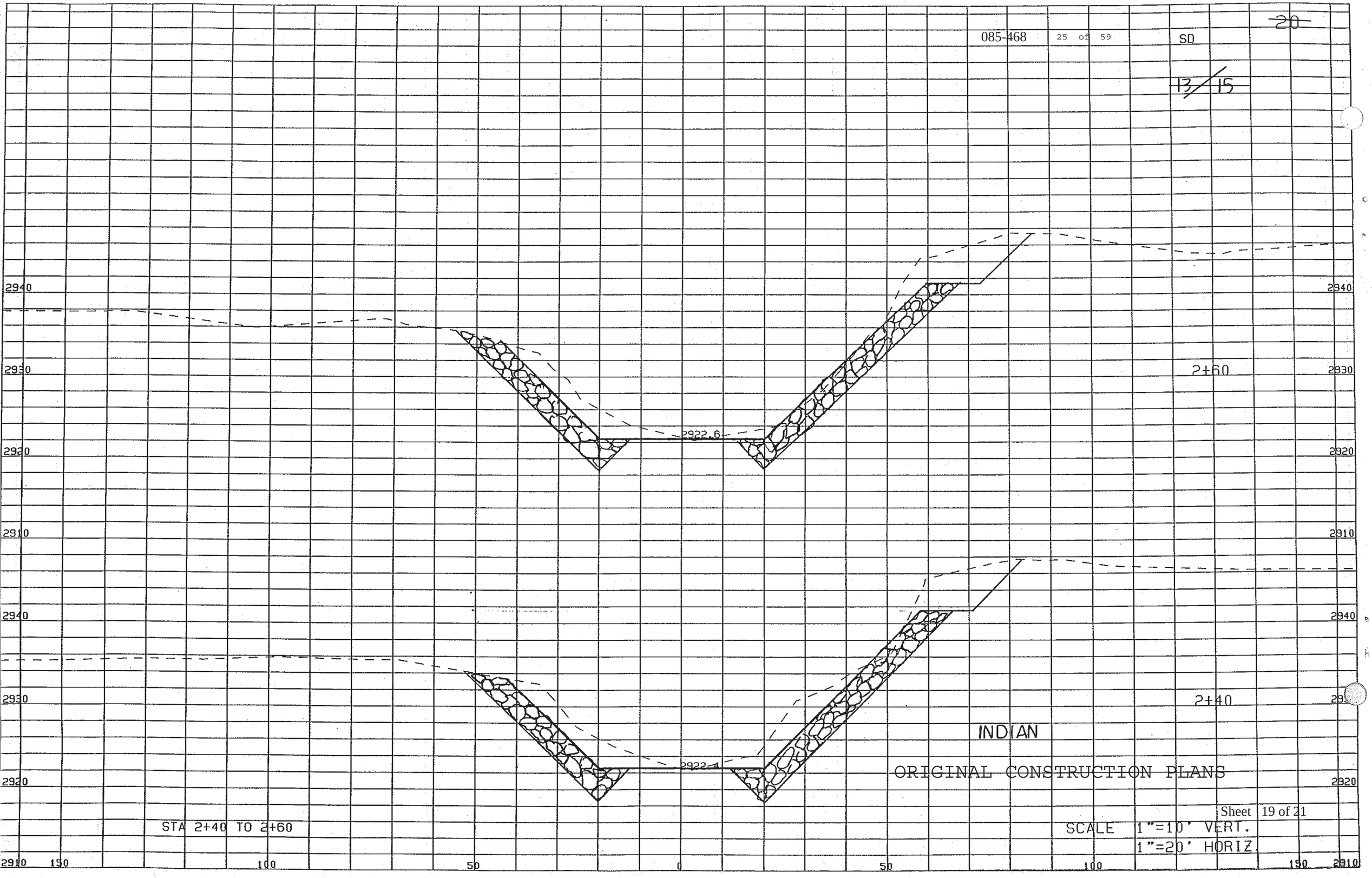
SD

13/15



INDIAN

ORIGINAL CONSTRUCTION PLANS

STA 2+40 TO 2+60

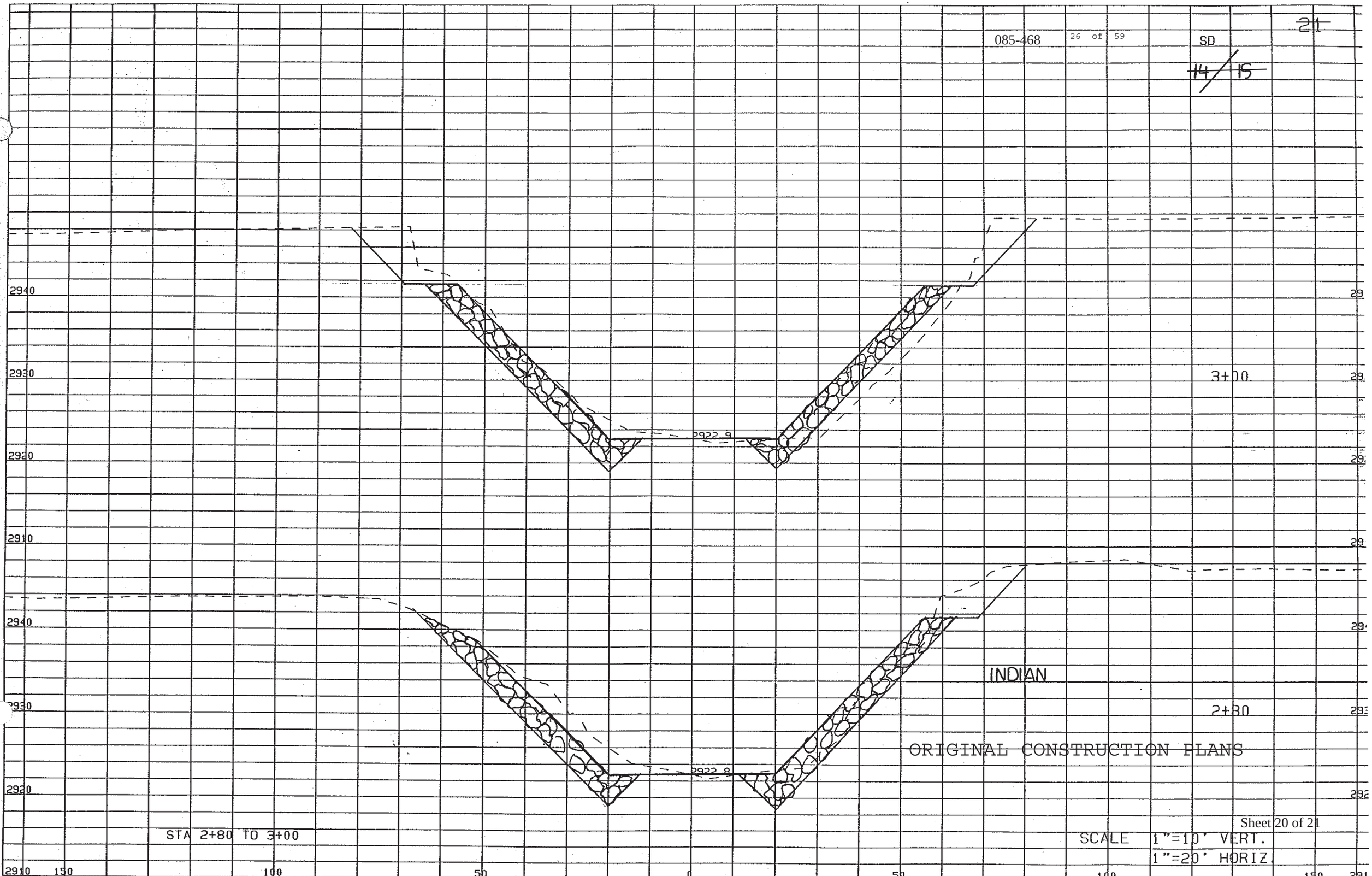
Sheet 19 of 21

SCALE 1"=10' VERT.
1"=20' HORIZ.

SD

~~14/15~~

~~21~~


2940
2930
2920
2910
2922.9
3+00
2940
2930
2920
2910
2922.9
2+80
INDIAN
ORIGINAL CONSTRUCTION PLANS
STA 2+80 TO 3+00
150
100
50
0
50
100
150
SCALE 1"=10' VERT.
1"=20' HORIZ.

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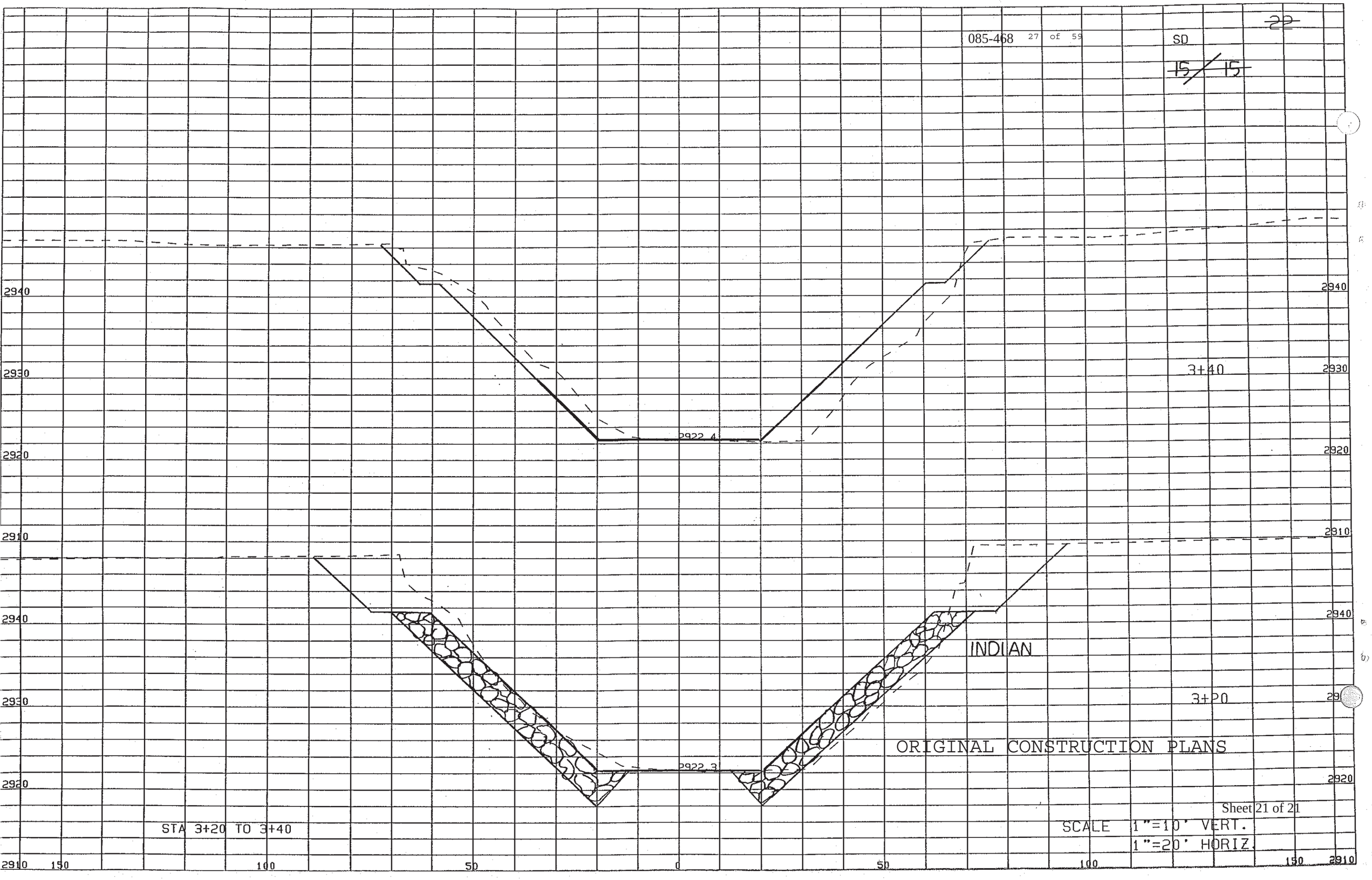
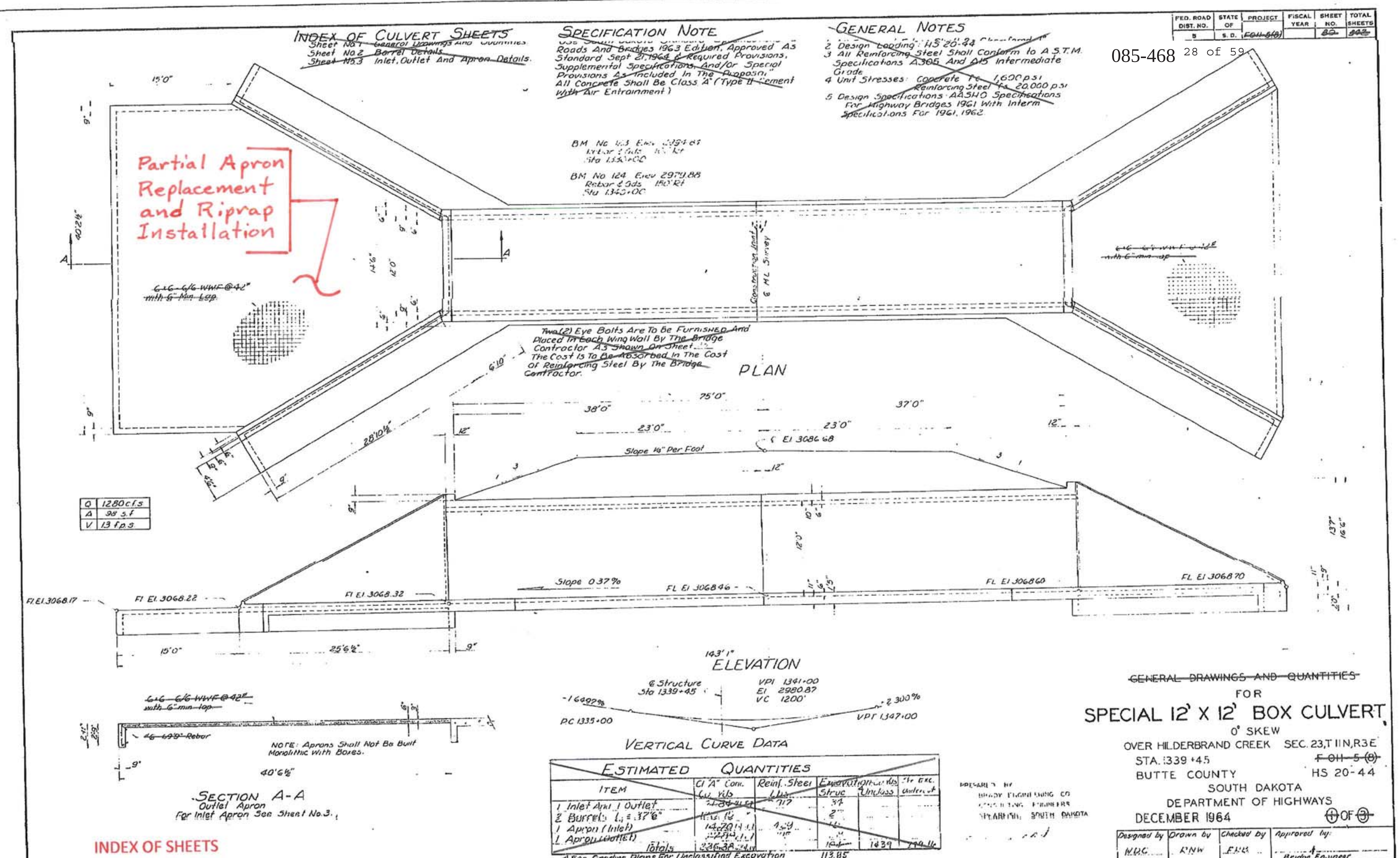
SD

~~22~~

~~15~~ / ~~15~~



Sheet 21 of 21



INDEX OF SHEETS

- Sheet No. 1 - Repair Layout
- Sheet No. 2 - Estimate of Quantities and Notes
- Sheet No. 3 - Images
- Sheet No. 4 - Outlet Apron Repair Details
- Sheet No. 5 - Outlet Apron Repair Details Continued
- Sheets No. 6 thru 9 - Original Construction Plans

US85 MRM 75.29

REPAIR LAYOUT

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	085-468	29	59

ESTIMATE OF STRUCTURE QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
120E0600	Contractor Furnished Borrow	180	Cu.Yd.
250E0020	Incidental Work, Grading	LS	LS
260E6010	Granular Material	21.8	Ton
460E0120	Class A45 Concrete, Box Culvert	16.0	CuYd
480E0100	Reinforcing Steel	1265	Lb.
700E0310	Class C Riprap	295	Ton
831E0110	Type B Drainage Fabric	272	Sq.Yd.

SPECIFICATIONS

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

DETAILS AND DIMENSIONS OF EXISTING BOX CULVERT

All details and dimensions of the existing box culvert, contained in these plans, are based on the original construction plans and shop plans. It is the Contractor's responsibility to inspect and verify the actual field conditions and any necessary as-built dimensions affecting the satisfactory completion of the work required for this project.

SCOPE OF BRIDGE WORK & SEQUENCE OF OPERATIONS

All work on this structure shall be accomplished with the traffic control shown elsewhere in the plans. An alternate sequence of operations may be submitted by the Contractor for approval by the Engineer at the pre-construction meeting.

1. Reconstruct the box culvert outlet per plan notes and details.

PRE-CONSTRUCTION MEETING

A pre-construction meeting is required prior to beginning the repair work. The purpose of the meeting is to review the plans and procedures. A representative from the Contractor and all Subcontractors shall attend this meeting along with Department personnel from the Area Office and Region Office. The Contractor must notify the Area Office at least three days prior to the meeting.

GENERAL NOTES

1. All concrete shall be Class A45 conforming to Section 460.
2. All reinforcing steel shall conform to ASTM A615 Grade 60.
3. All exposed edges shall be chamfered ¾ inch
4. Reinforcing steel shall be placed at mid-depth of the apron slab.
5. Cost of Preformed Expansion Joint Filler shall be incidental to the other contract items.

DESIGN MIX OF CONCRETE

1. Class A45 Concrete shall be used for the bid item Class A45 Concrete, Box Culvert.
2. The type of cement, concrete strength requirements, aggregate requirements, slump and air requirements for the contract item Class A45 Concrete, Box Culvert shall conform to the requirements of Section 460 of the Construction Specification.

OUTLET RECONSTRUCTION

1. The box culvert outlet including the outlet apron and the area downstream of the apron experienced scour. The outlet area shall be reshaped and reconstructed and the outlet apron shall be replaced per the plan details. On-site materials or borrow materials shall be used as approved by the Engineer. Borrow material shall be furnished by the Contractor as Contractor Furnished Borrow.

2. Prior to placement of on-site materials or borrow material, the area shall be re-graded to a uniform surface. Any pieces of broken up concrete and large rocks shall be removed and disposed of by the Contractor.

3. Compaction of the reconstructed embankment under the outlet apron and the downstream area and the 6" granular material layer under the outlet apron shall be according to the Specified Density Method.

4. All costs associated with the embankment reconstruction at the outlet shall be incidental to the contract price for Incidental Work, Grading. Borrow required and all associated costs shall be paid for at the contract unit price per cubic yard for Contractor Furnished Borrow. The estimated quantity of contractor furnished borrow is 180 cubic yards.

GRANULAR MATERIAL

The granular material used for the 6" granular material layer under the outlet apron shall meet the requirements of Backfill Material in Section 421 of the Standard Specifications For Roads and Bridges. All costs associated with furnishing and installing the granular material shall be incidental to the unit price for Granular Material.

RIPRAP

1. The Class C Riprap shall be constructed to the configuration, limits and elevations shown on the new details included in the plans. The stream banks in the areas of riprap placement shall be reconstructed to tie the existing stream banks to the new riprap alignment and elevations as approved by the Engineer. Cost of reconstructing the stream banks shall be incidental to the contract price bid for Incidental Work, Grading.

2. Drainage fabric will be placed underneath the Class C Riprap. The fabric shall conform to Section 831 of the Standard Specifications.

3. The fabric shall be placed so that the lapped joints between rolls (if any) are transverse to the direction of flow with the overlapping in the direction of flow. All joints shall be lapped a minimum of twelve (12).

4. Vehicles and equipment shall not be operated directly on the fabric. The full depth of riprap shall be in place before any equipment is allowed on the area.

5. Prior to placement of the drainage fabric, the surface to be covered shall be smooth, free of obstructions, and conform to the plan configuration.

6. A factor of 1.4 tons/cu.yd. was used to convert Cu. Yds. to Tons.

11. Type B Drainage Fabric will be measured and paid for by the square yard of surface area of fabric accepted complete in place on the project. Measurement will not include fabric required for lapped seams or joints. Payment will be full compensation for furnishing the Drainage Fabric and for all labor, equipment, materials, and incidentals necessary to prepare the area for the fabric and satisfactory installation of the Drainage Fabric.

CONTRACTOR FURNISHED BORROW

The Contractor shall provide a suitable site for Contractor Furnished Borrow material. The Contractor is responsible for obtaining all required permits and clearances for the borrow site. The borrow material shall be approved by the Engineer. Contractor Furnished Borrow will be measured.

Restoration of the Contractor Furnished Borrow site shall be the responsibility of the Contractor.

ESTIMATE OF STRUCTURE QUANTITIES AND NOTES FOR

SPECIAL 12' X 12' BOX CULVERT

US 85 MRM 75.29

AUGUST 2014

2 9

DESIGNED BY:	CK. DES. BY	DRAFTED BY	
RS	RS	RS	
BUTEi3LQ	I3LQxxxx		BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	085-468	30	59

IMAGES
FOR
SPECIAL 12’ X 12’ BOX CULVERT

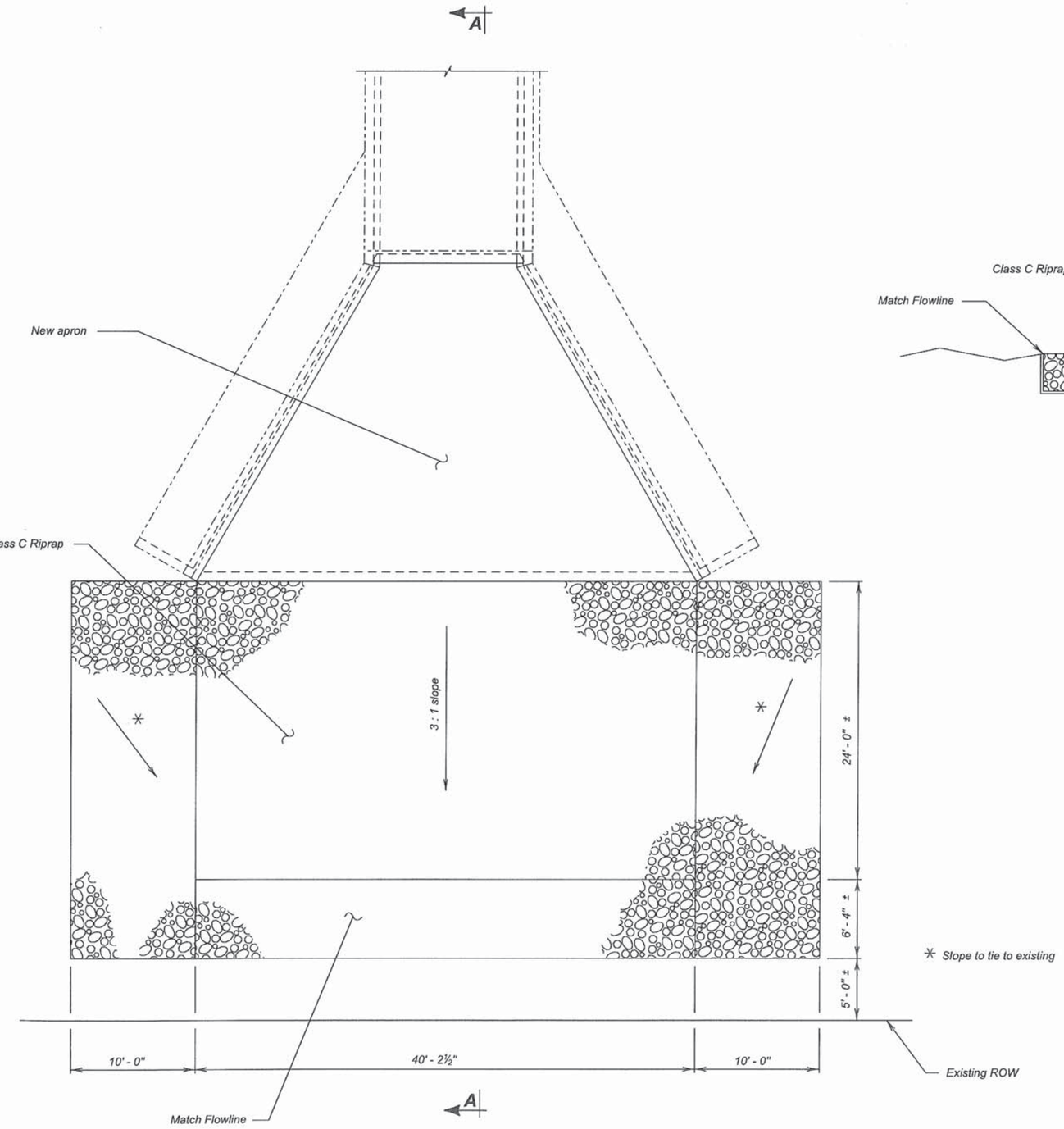
US 85 MRM 75.29

AUGUST 2014

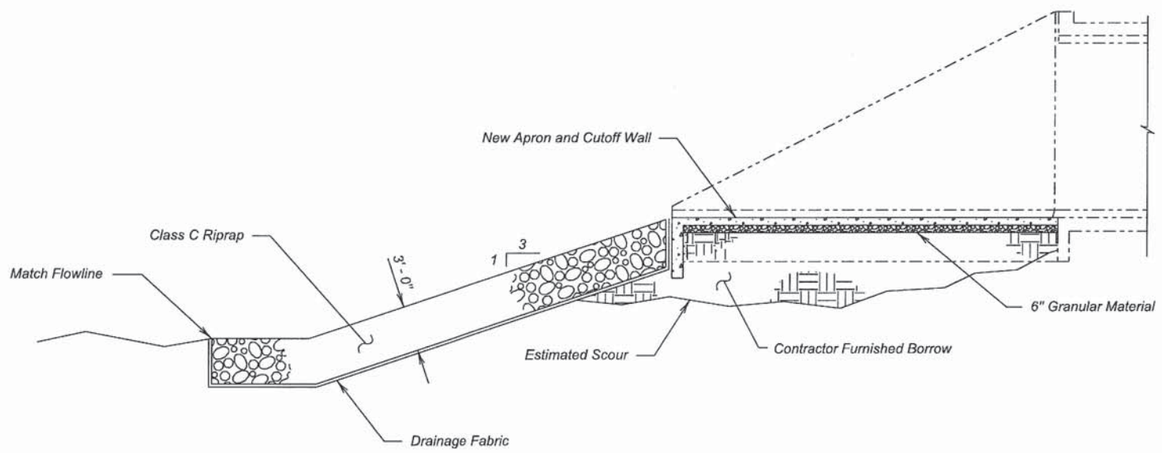
3 9

DESIGNED BY:	CK. DES. BY	DRAFTED BY:	
RS BUTEI3LQ	RS I3LQxxx	RS	BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	085-468	31	59



PLAN



SEC. A - A

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Contractor Furnished Borrow	Cu.Yd.	180
Granular Material	Ton	21.8
Class A45 Concrete, Box Culvert	Cu.Yd.	16.0
Reinforcing Steel	Lb.	1265
Class C Riprap	Ton	295
Type B Drainage Fabric	Sq.Yd.	272

OUTLET APRON REPAIR DETAILS
FOR
SPECIAL 12' X 12' BOX CULVERT

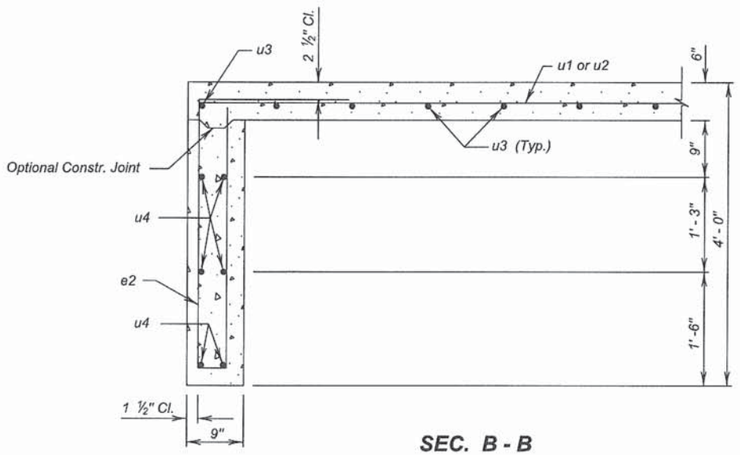
US85 MRM 75.29 — 0° SKEW
OVER HILDERBRAND CREEK — SEC. 23-T11N-R3E
PCN 13LQ — 085-468

BUTTE COUNTY
S. D. DEPT. OF TRANSPORTATION
AUGUST 2014

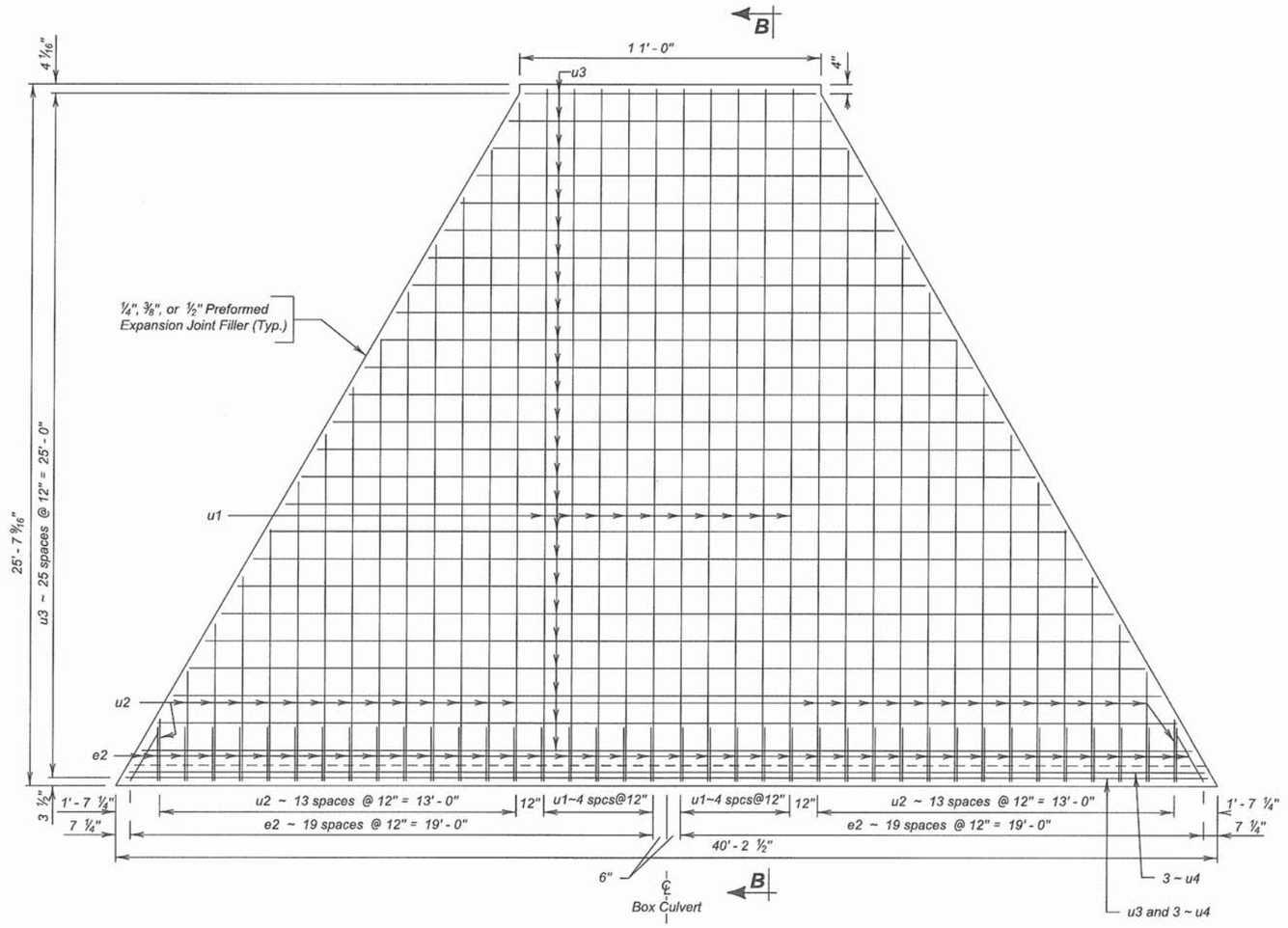
(4) OF (9)

DESIGNED BY	DRAWN BY	CHECKED BY	
RS	RS	RS	
BUTE13LQ	13LQXXXX		BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	085-468	32	59



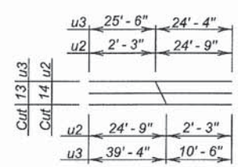
SEC. B - B

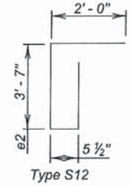


APRON PLAN

REINFORCING SCHEDULE

Mk.	No.	Size	Length	Type	Bending Details
OUTLET APRON					
e2	40	4	9' - 6"	S12	
u1	10	4	25' - 3"	Str.	
u2	14	4	27' - 0"	Str.	
u3	13	4	49' - 10"	Str.	
u4	6	4	39' - 1"	Str.	





Type S12

NOTES:
All dimensions are out to out of bars.
℄ See cutting diagram.

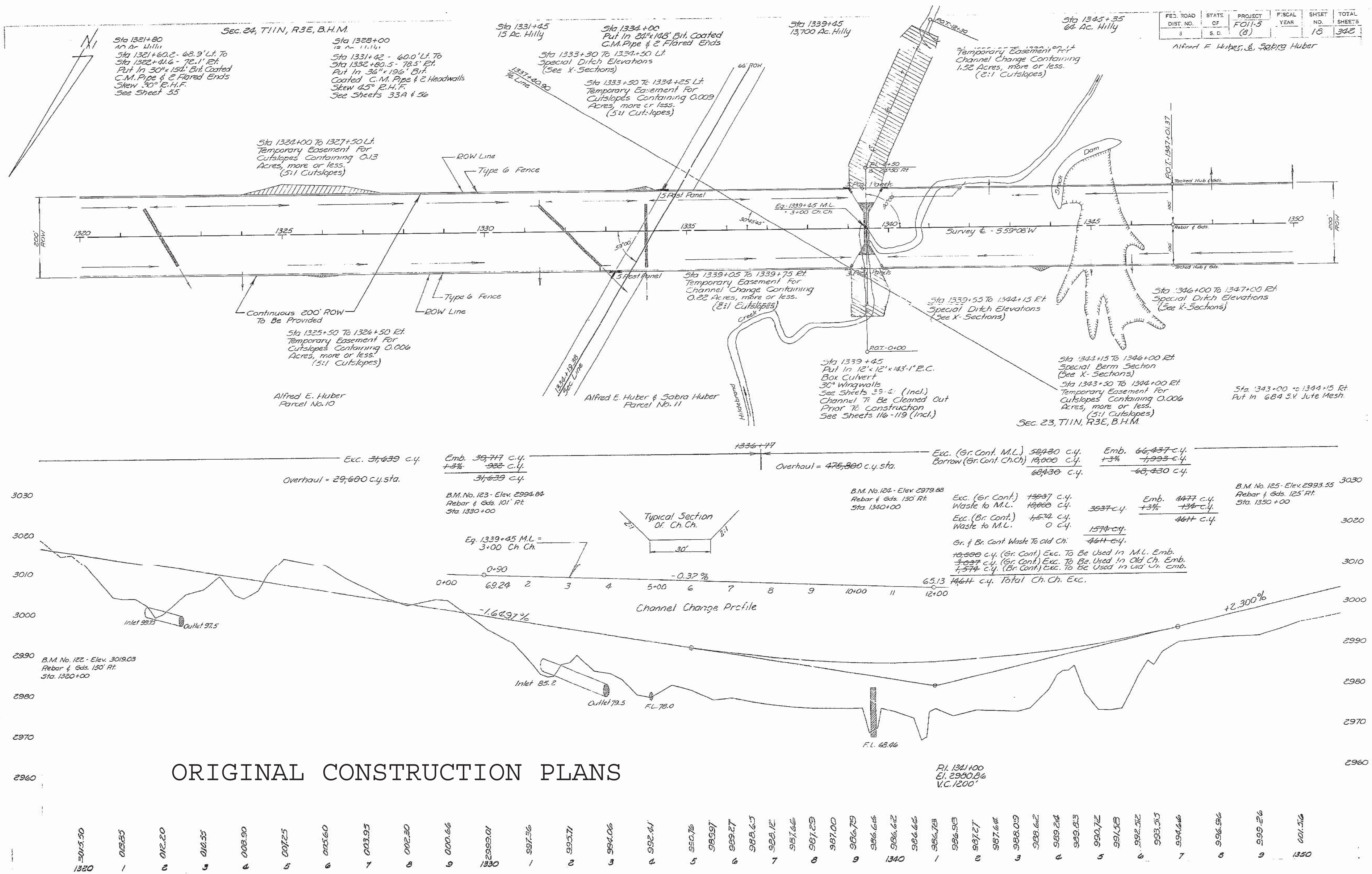
OUTLET APRON REPAIR DETAILS CONTINUED
FOR
SPECIAL 12' X 12' BOX CULVERT

US85 MRM 75.29 — 0° SKEW
OVER HILDERBRAND CREEK — SEC. 23-T11N-R3E
PCN i3LQ — 085-468

BUTTE COUNTY
S. D. DEPT. OF TRANSPORTATION
AUGUST 2014

5 OF 9

DESIGNED BY	CK. DES. BY	DRAFTED BY	
RS	RS	RS	
BUTEi3LQ	i3LQXXXX		BRIDGE ENGINEER



ORIGINAL CONSTRUCTION PLANS

INDEX OF CULVERT SHEETS

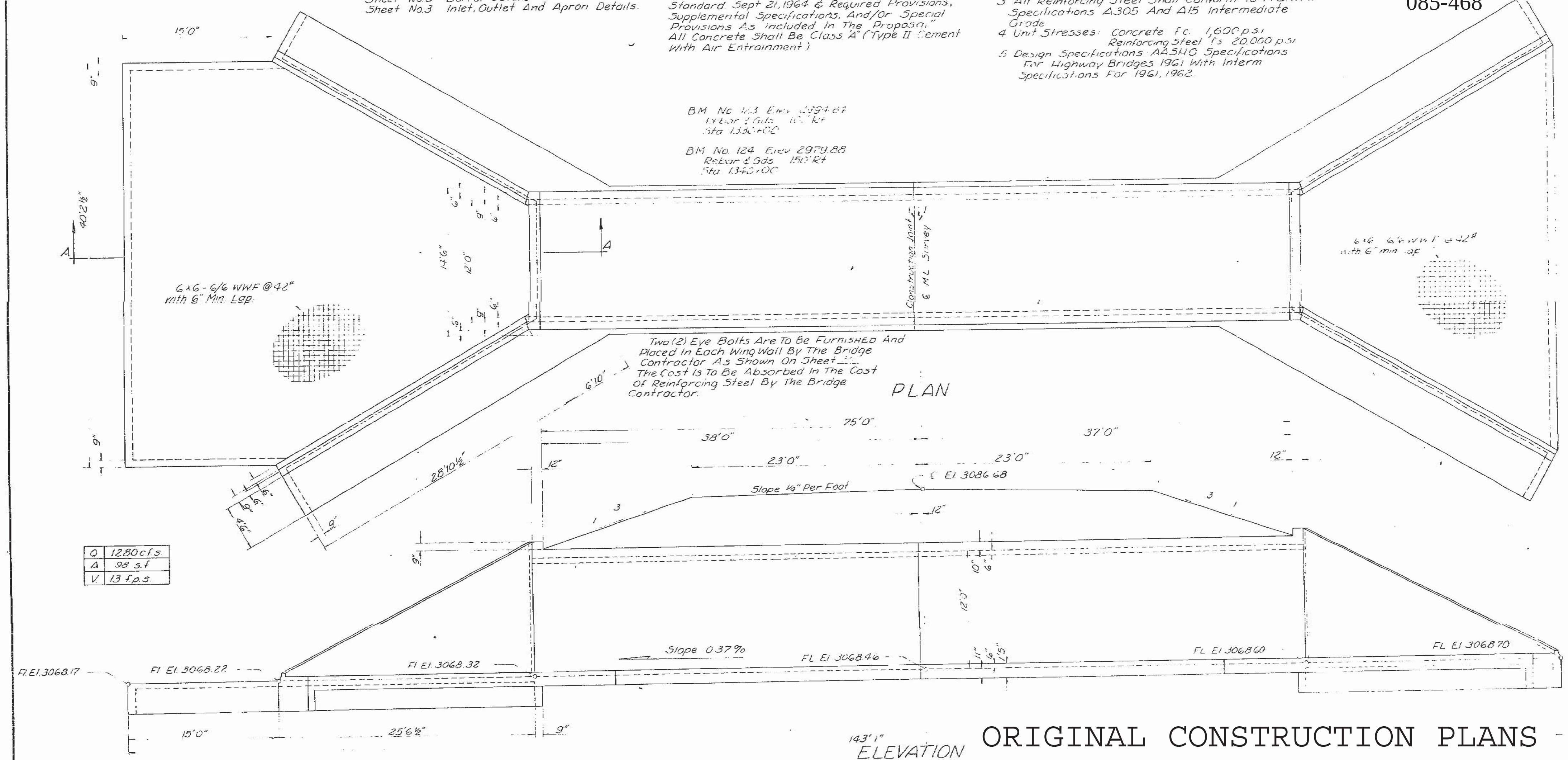
Sheet No. 1 General Drawings And Quantities.
Sheet No. 2 Barrel Details
Sheet No. 3 Inlet, Outlet And Apron Details.

SPECIFICATION NOTE

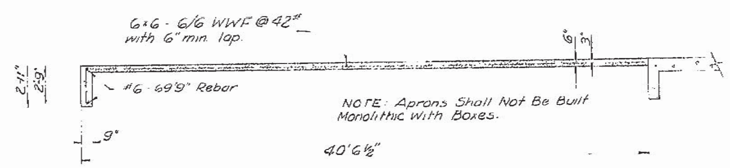
Use South Dakota Standard Specifications For Roads And Bridges 1963 Edition, Approved As Standard Sept 21, 1964 & Required Provisions, Supplemental Specifications, And/Or Special Provisions As Included In The Proposal." All Concrete Shall Be Class "A" (Type II Cement With Air Entrainment)

GENERAL NOTES

1. All Exposed Edges Shall Be Chamfered 1"
2. Design Loading: HS 20-44
3. All Reinforcing Steel Shall Conform to A.S.T.M. Specifications A305 And A15 Intermediate Grade
4. Unit Stresses: Concrete f'c 1,600 p.s.i. Reinforcing Steel fs 20,000 p.s.i.
5. Design Specifications: AASHO Specifications For Highway Bridges 1961 With Interim Specifications For 1961, 1962.

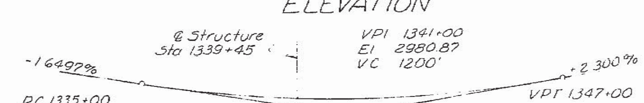


Q	1280 c.f.s.
A	98 s.f.
V	13 f.p.s.



NOTE: Aprons Shall Not Be Built Monolithic With Boxes.

SECTION A-A
Outlet Apron
For Inlet Apron See Sheet No. 3.



VERTICAL CURVE DATA

~~ESTIMATED QUANTITIES~~

ITEM	Cl "A" Conc. Cu. Yds.	Reinf. Steel Lbs.	Excavation Cu. Yds. Struc.	Excavation Cu. Yds. Unclass.[a]	Str. Exc. Undercut
1 Inlet And 1 Outlet	[illegible]	[illegible]	37		
2 Barrels L = 37'6"	[illegible]		[illegible]		
1 Apron (Inlet)	14.70	[illegible]	[illegible]		
1 Apron (Outlet)	[illegible]	[illegible]	[illegible]		
Totals	235.38		~~164~~ 113.85	1439	[illegible]

[a] See Grading Plans For Unclassified Excavation

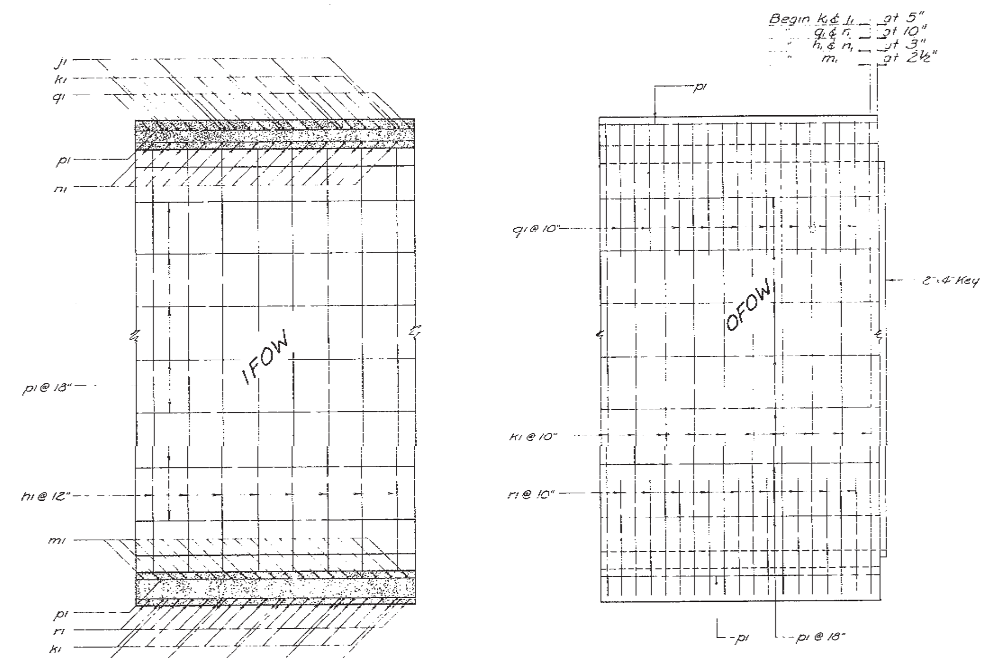
PREPARED BY
BRADY ENGINEERING CO.
CONSULTING ENGINEERS
SPEARFISH, SOUTH DAKOTA

ORIGINAL CONSTRUCTION PLANS

GENERAL DRAWINGS AND QUANTITIES
FOR
SPECIAL 12' X 12' BOX CULVERT
0° SKEW
OVER HILDERBRAND CREEK SEC. 23, T 11N, R3E
STA. 1339+45 ~~F 011-5 (8)~~
BUTTE COUNTY HS 20-44
SOUTH DAKOTA
DEPARTMENT OF HIGHWAYS
DECEMBER 1964 7 of 9 ~~1 OF 3~~

Designed by	Drawn by	Checked by	Approved by:
W.D.C.	R.N.W.	E.R.B.	Bridge Engineer

FED. ROAD DIST. NO.	STATE OF	PROJECT	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	S. D.	~~F 011-5(8)~~		~~13~~	~~30~~



ELEVATION

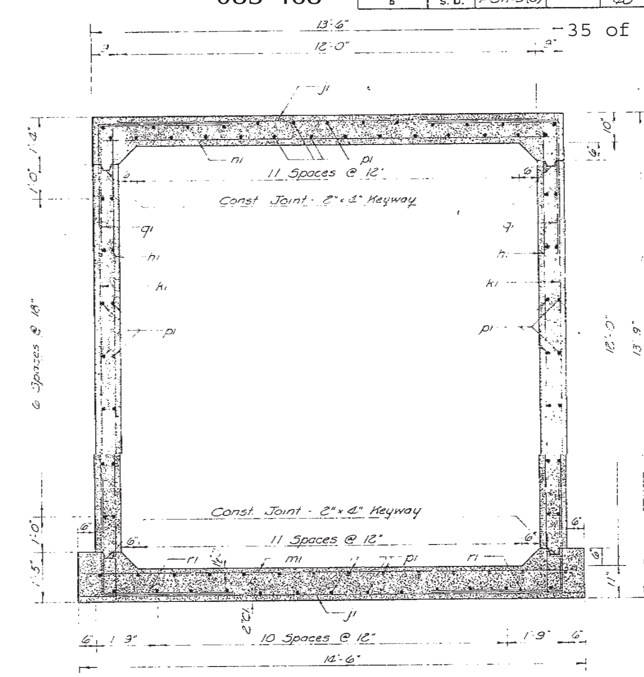
Note: All dimensions are out to out of bars.

REINFORCING SCHEDULE				
Mk	No.	Size	Length	Type
h1		4	14'-3"	17A
j1		4	12'-0"	Str
k1		6	21'-0"	17
m1		7	14'-0"	Str
n1		7	13'-0"	Str
p1		4	38'-3"	Str
q1		5	7'-6"	17A
r1		6	7'-6"	17A

Bending Details: Type 17A, Type 17, Type 17A

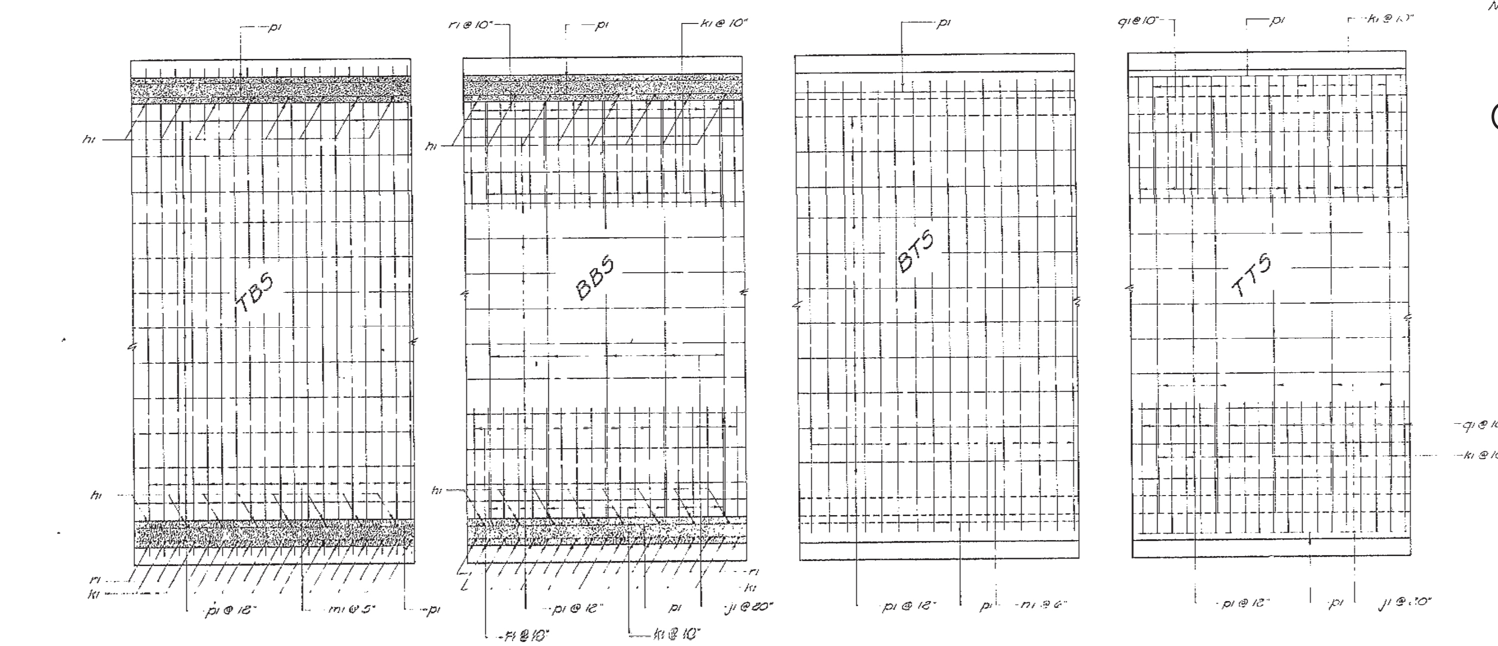
LEGEND FOR PLACING RE-STEEL
OFOW - Outside Face Of Wall
IFOW - Inside Face Of Wall
IFWW - Inside Face Of Wing Wall
OFWW - Outside Face Of Wing Wall
TTS - Top Of Top Slab
BTS - Bottom Of Top Slab
TBS - Top Of Bottom Slab
BBS - Bottom Of Bottom Slab

ESTIMATED QUANTITIES			
ITEM	Cl. "A" Conc. Cu. Yd.	Re-Steel Lbs.	Struct. Exc. Cu. Yd.
Totals			



BARREL SECTION

Note: Use 1" Clear Cover on Reinforcing Steel Except as Noted



PLAN

ORIGINAL CONSTRUCTION PLANS

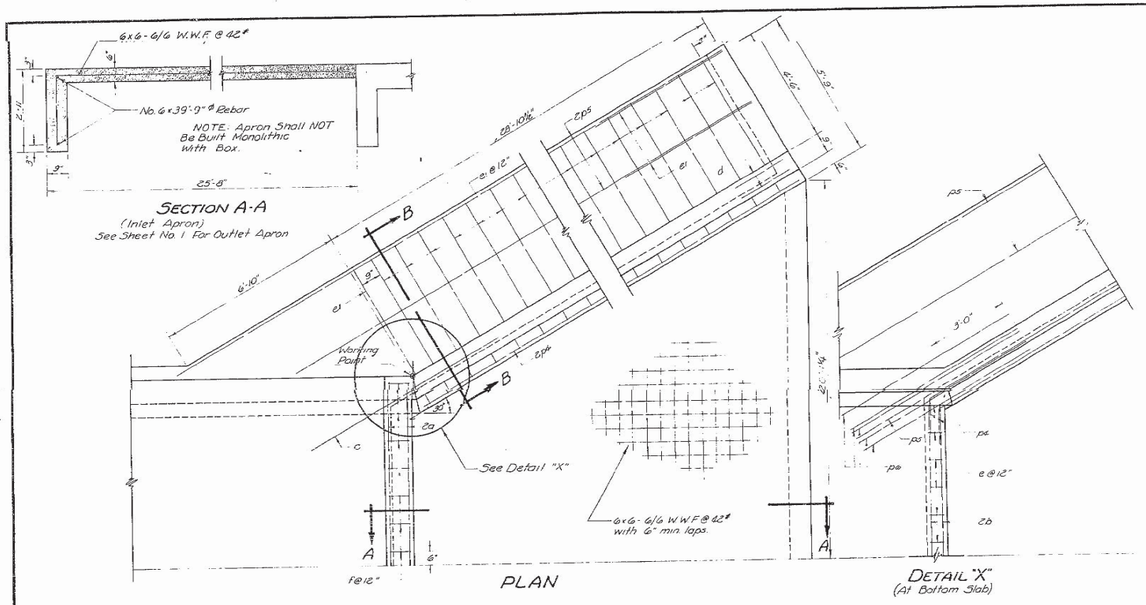
BARREL DETAILS
FOR
SPECIAL 12' X 12' BOX CULVERT
0° SKEW
OVER HILDERBRAND CREEK — SEC. 23, T11N, R3E
STA. 1339+45 — ~~F 011-5(8)~~
BUTTE COUNTY — HS 20-44.
SOUTH DAKOTA
DEPARTMENT OF HIGHWAYS
DECEMBER 1964

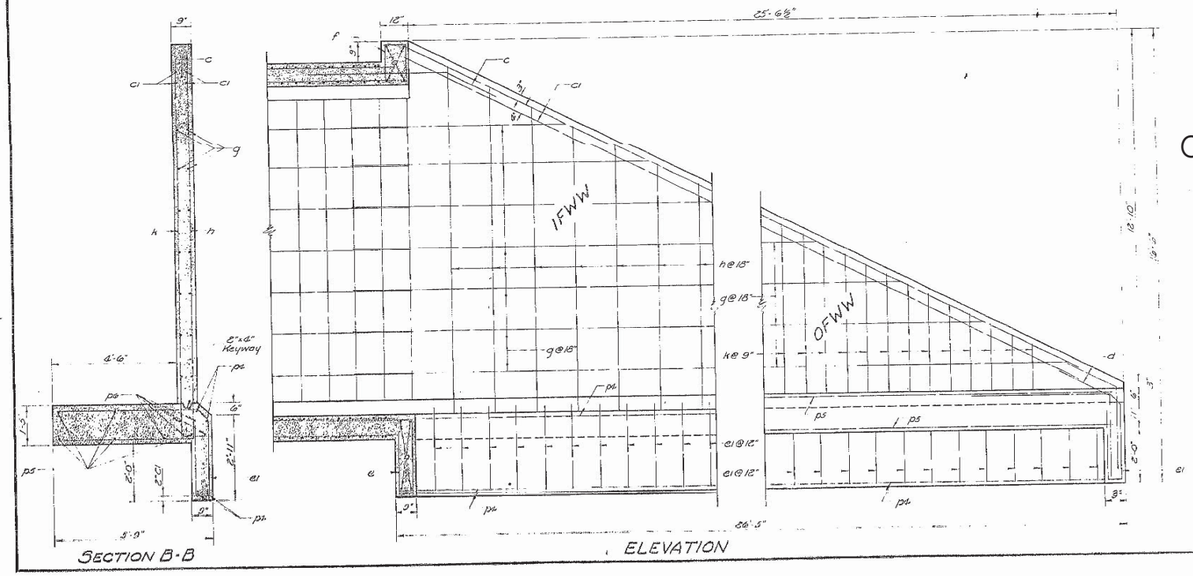
PREPARED BY
BRASH ENGINEERING CO.
CONSULTING ENGINEERS
SPEARFISH, SOUTH DAKOTA

Designed by	Drawn by	Checked by	Approved by
W.D.C.	L.A.M.	F.R.B.	Bridge Engineer

085-468 36 of 59

FED. ROAD DIST. NO.	STATE OF	PROJECT	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	S. D.	~~FO11~~ (8)		~~9~~	~~9~~

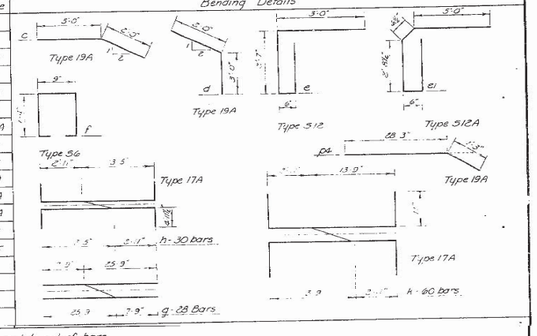




REINFORCING SCHEDULE

Mk	No	Size	Length	Type
a	8	6	13'-0"	Str
b	8	6	11'-0"	Str
c	4	11	7'-0"	19A
c1	16	5	27'-1"	Str
d	16	8	5'-0"	19A
e	32	4	8'-3"	512
e1	124	6	11'-3"	512A
f	28	4	3'-9"	56
g	28	4	33'-6"	Str
h	30	4	30'-0"	17A
k	60	7	18'-6"	17A
pa	16	4	29'-6"	19A
ps	20	4	37'-0"	Str
pe	20	6	7'-0"	Str

Bending Details



Note: All dimensions are out to out of bars.
* Bend in field where necessary.

ESTIMATED QUANTITIES

ITEM	Cl "A" Conc. Cu.Yd.	Re-Steel Lbs.	Struct Exc. Cu.Yd.
1 INLET & 1 OUTLET	71.54	491	34
1 OUTLET APRON	14.63	429	15
OUTLET APRON	27.87	795	28
TOTALS	114.43	914.3	77

ORIGINAL CONSTRUCTION PLANS

INLET AND OUTLET DETAILS
FOR
SPECIAL 12' X 12' BOX CULVERT
0° SKEW
OVER HILDERBRAND CREEK SEC. 23, T 11 N, R 3 E
STA. 1339+45 ~~F 011 5 (8)~~
BUTTE COUNTY HS 20-44
SOUTH DAKOTA
DEPARTMENT OF HIGHWAYS
DECEMBER 1964 9 of 9 ~~9~~ OF ~~9~~

PREPARED BY
BRADY ENGINEERING CO
CONSULTING ENGINEERS
SPEARFISH, SOUTH DAKOTA

Designed by	Drawn by	Checked by	Approved by
W.D.C.	L.A.M.	E.R.B.	Bridge Engineer

FED.HWY. ADMIN.NO.	STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
8	S.D.	~~NH 0085(00)72~~	~~6~~	~~15~~

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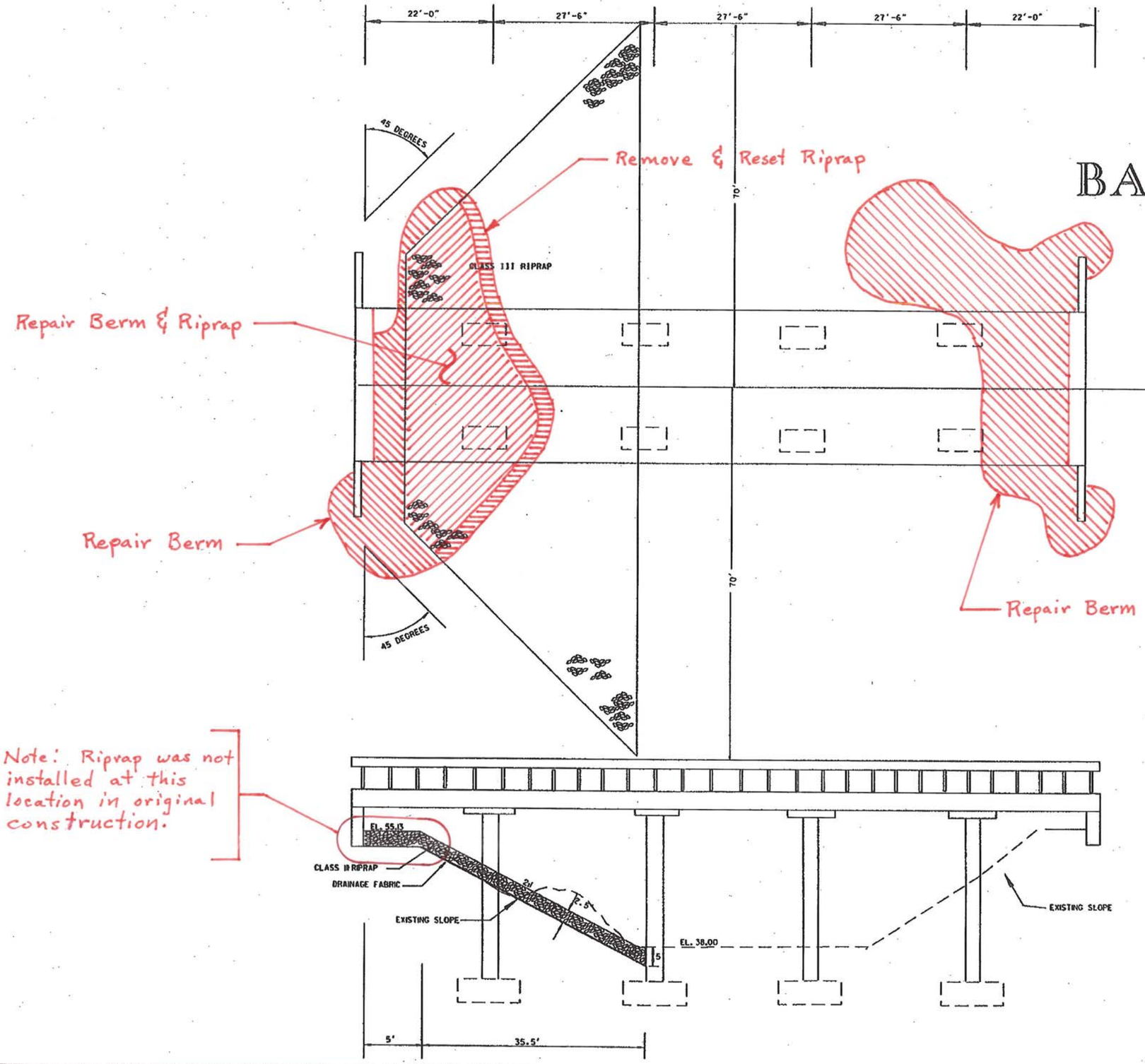
BATTLE CREEK



INDEX OF SHEETS

Sheet No. 1 - Battle Creek Repair Layout
Sheet No. 2 - Estimate of Structure Quant. & Notes
Sheet No. 3 - Notes (Continued)
Sheets No. 4 thru 6 - Images
Sheet No. 7 - Abut. 1 (South) Bridge Berm Details
Sheet No. 8 - Abut . 6 (North) Bridge Berm Details
Sheets No. 9 thru 18 - Original Construction Plans

BATTLE CREEK
REPAIR LAYOUT

RIP RAP DETAILS
128'-6" CONTINUOUS CONCRETE BRIDGE

ON U.S. 85
OVER BATTLE CREEK
STA 679+60.75 TO 680+89.25

30' - 0" ROADWAY
SEC. 6 - T12N - R5E
STR. NO. 10-249-129

BUTTE COUNTY
SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION

Sheet 1 of 18

DRAWN BY:
DATE:
CHECKED BY:
DATE:

ESTIMATE OF STRUCTURE QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
110E5450	Salvage Riprap	23	Cu.Yd.
120E0600	Contractor Furnished Borrow	365	CuYd
250E0020	Incidental Work, Grading	LS	LS
462E0200	Controlled Density Fill	18	CuYd
700E0310	Class C Riprap	105	Ton
700E2000	Place Riprap	23	CuYd
831E0110	Type B Drainage Fabric	135	SqYd

SPECIFICATIONS

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

DETAILS AND DIMENSIONS OF EXISTING BRIDGE

All details and dimensions of the existing bridge, contained in these plans, are based on the original construction plans and shop plans. It is the Contractor's responsibility to inspect and verify the actual field conditions and any necessary as-built dimensions affecting the satisfactory completion of the work required for this project.

SCOPE OF BRIDGE WORK & SEQUENCE OF OPERATIONS

All work on this structure shall be accomplished with the traffic control shown elsewhere in the plans. An alternate sequence of operations may be submitted by the Contractor for approval by the Engineer at the pre-construction meeting.

1. Fill the voids under the existing abutments with controlled density fill as shown in the plans.

2. Remove 3' ± of existing riprap at the top of the riprap that is still in-place on Abutment No. 6 berm for reset. The purpose is to enable placing the new drainage fabric over the existing drainage fabric that is to remain in place.

3. Reshape the berm and wing wall slopes and reset the existing riprap that was removed (Note 2) and install new riprap as shown in the plans.

PRE-CONSTRUCTION MEETING

A pre-construction meeting is required prior to beginning the repair work. The purpose of the meeting is to review the plans and procedures. A representative from the Contractor and all Subcontractors shall attend this meeting along with Department personnel from the Area Office and Region Office. The Contractor must notify the Area Office at least three days prior to the meeting.

BRIDGE BERM REPAIR

1. The bridge berms experienced scour in front of and below the abutments as well as both upstream and downstream of the bridge. The berms shall be reshaped and reconstructed to the original template and the new details included in the plans using on-site materials or borrow material as approved by the Engineer. Borrow material shall be furnished by the Contractor.

2. Bench the berm slopes into the embankment during reshaping and reconstruction in accordance with Section 120.3.B.1 of the Standard Specifications For Roads and Bridges. Place the soil in horizontal lifts parallel to the abutments. Shape the berm in front of the wing walls to divert runoff from the roadway inslope away from the face of the berm slope. Compaction of the reconstructed embankment will be according to the Specified Density Method. Special equipment and/or additional effort may be required to accomplish compaction of the berms due to the confined work area and reduced vertical clearance.

3. All costs associated with berm reconstruction shall be incidental to the contract price for Incidental Work, Grading. Borrow required and all associated costs shall be paid for at the contract unit price per cubic yard for Contractor Furnished Borrow. The estimated quantity of Contractor Furnished Borrow is 365 cubic yards.

RIPRAP

1. The Class C Riprap shall be placed to the configuration, limits and elevations shown on the Original Construction Plans and new the details included in the plans. The stream banks in the areas of riprap placement shall be reconstructed to their original alignment and elevations as approved by the Engineer. Cost of reconstructing the stream banks shall be per the Bridge Berm Repair note.

2. The existing riprap that is still in place on the Abutment 6 bridge berm shall remain in place except 3' ± on the top of the slope shall be removed for reset. All costs associated with removal of the existing riprap for reset shall be incidental to the contract unit price per cubic yard for Salvage Riprap. The estimated quantity is 23 cubic yards. Plan quantity will be paid for Salvage Riprap.

3. The existing drainage fabric that is exposed shall be removed and disposed of by the Contractor. The existing drainage fabric that is under the riprap that is to be removed and reset (Note 2) shall be left in place. All associated costs shall be incidental to the contract price for Incidental Work, Grading.

4. Excavate and/or fill to limits shown on cross sections for riprap placement. Any excess material shall be disposed of by the Contractor as approved by the Engineer. All costs associated with excavating and disposing material and/or providing borrow material shall be incidental to the contract price for Incidental Work, Grading and the contract price per cubic yard for Contractor Furnished Borrow per the Bridge Berm Repair note.

5. Drainage fabric shall be placed underneath the limits of the reset riprap and new Class C Riprap. The fabric shall conform to Section 831 of the Standard Specifications.

6. The fabric shall be placed so that the lapped joints between rolls (if any) are transverse to the direction of flow with the overlapping in the direction of flow. All joints shall be lapped a minimum of twelve (12) inches except the joint under the remove and reset riprap shall be 3'±. This joint will also not be transverse to the flow.

7. Vehicles and equipment shall not be operated directly on the fabric. The full depth of riprap shall be in place before any equipment is allowed on the area.

8. Prior to placement of the drainage fabric, the surface to be covered shall be smooth, free of obstructions, and conform to the plan configuration.

9. Existing riprap that was removed shall be reset. Additional riprap that is required to complete the riprap installation to the Original Construction Plans and to the new details configuration, limits and elevations shall be provided by the Contractor.

10. A factor of 1.4 tons/cu.yd. was used to convert Cu. Yds. to Tons.

11. Type B Drainage Fabric will be measured and paid for by the square yard of surface area of fabric accepted complete in place on the project. Measurement will not include fabric required for lapped seams or joints except for the lap of the new fabric over the existing fabric at the remove and reset riprap location. All costs associated with preparing the area for the fabric and furnishing and installing the fabric shall be incidental to the contract unit price per square yard for Type B Drainage Fabric.

12. All costs associated with resetting the existing riprap that was removed and reset shall be incidental to the contract price per cubic yard for Place Riprap. Plan quantity will be paid for Place Riprap. All costs associated with furnishing and installing new Class C Riprap provided by the Contractor shall be incidental to the contract price per cubic yard for Class C Riprap.

ESTIMATE OF STRUCTURE QUANTITIES AND NOTES FOR

128' – 6" CONTINUOUS CONCRETE BRIDGE

Str. No. 10-249-129

AUGUST 2014 2 18

DESIGNED BY:	CK. DES. BY	DRAFTED BY	
RS	RS	RS	BRIDGE ENGINEER
BUTEi3LP	I3LPxxxx		

CONTRACTOR FURNISHED BORROW

The Contractor shall provide a suitable site for Contractor Furnished Borrow material. The Contractor is responsible for obtaining all required permits and clearances for the borrow site. The borrow material shall be approved by the Engineer. Contractor Furnished Borrow will be measured.

Restoration of the Contractor Furnished Borrow site shall be the responsibility of the Contractor.

CONTROLLED DENSITY FILL

Controlled density fill shall be placed in the voids under the abutments per the plan details.

Controlled density fill shall be a flowable mortar material. Material and mixing shall be in accordance with the Section 462 of the Standard Specifications, except as modified below. The mix shall be as follows:

Mix Design:

Material	Rate per Cubic Yard
Portland Cement, Type II	100 Lb
Fine Aggregate	2,600 Lb
Coarse Aggregate	None
Water	60 Gal
Fly Ash, Type C	300 Lb

The fine aggregate shall be natural sand consisting of mineral aggregate particles conforming to the following gradation requirements:

Passing a 3/8 Inch Sieve	100%
Passing a No. 200 Sieve	0-10%

The mix shown above is designed to produce a minimum compressive strength of 100 psi. The Engineer may allow adjustments to the proportion of water at the site to provide the necessary consistency of the mix.

Controlled density fill shall be contained within the required limits with sandbags or other methods approved by the Engineer.

Cost for furnishing and installing the controlled density fill, including sandbags, labor, material, equipment and incidentals necessary to complete the work shall be included in the contract unit price per cubic yard for Controlled Density Fill.

The quantity included in the plans is only an estimate. Actual field conditions may vary. The quantity of Controlled Density Fill will be the quantity delivered and placed.

Do not place Controlled Density Fill during inclement weather, e.g. rain, when the subgrade is frozen, or when the subgrade contains an abnormal amount of moisture from recent rainfall as evidenced by standing water on the pavement or in joints or cracks. Do not place controlled Density Fill when ambient air temperature of 40° F or less is anticipated in the 24 hour period following proposed placement. Produce and deliver the flowable fill at a minimum temperature of 50° F. Protect flowable fill from freezing for a period of 36 hours after placement.

NOTES (CONTINUED)
FOR
128’ – 6” CONTINUOUS CONCRETE BRIDGE

Str. No. 10-249-129

AUGUST 2014 **3** **18**

DESIGNED BY:	CK. DES. BY	DRAFTED BY:	
RS	RS	RS	
BUTEi3LP	I3LPxxx		BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	085-468	40	59

IMAGES
FOR
128’ – 6” CONTINUOUS CONCRETE BRIDGE

Str. No. 10-249-129

AUGUST 2014

4 18

DESIGNED BY:	CK. DES. BY	DRAFTED BY	
RS	RS	RS	
BUTEi3LP	I3LPxxxx		BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	085-468	41	59

IMAGES
FOR
128’ – 6” CONTINUOUS CONCRETE BRIDGE

Str. No. 10-249-129

AUGUST 2014

5 18

DESIGNED BY:	CK. DES. BY	DRAFTED BY:	
RS	RS	RS	
BUTEi3LP	I3LPxxxx		BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	085-468	42	59

IMAGES
FOR
128’ – 6” CONTINUOUS CONCRETE BRIDGE

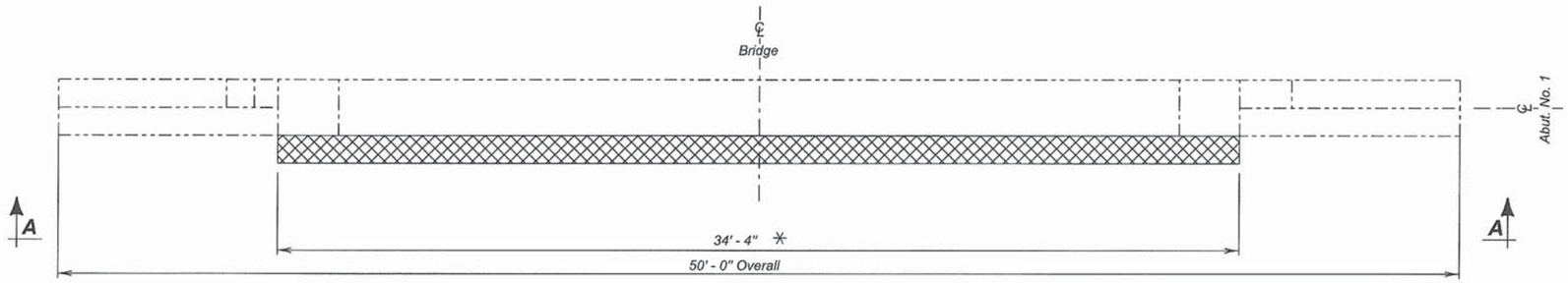
Str. No. 10-249-129

AUGUST 2014

6 18

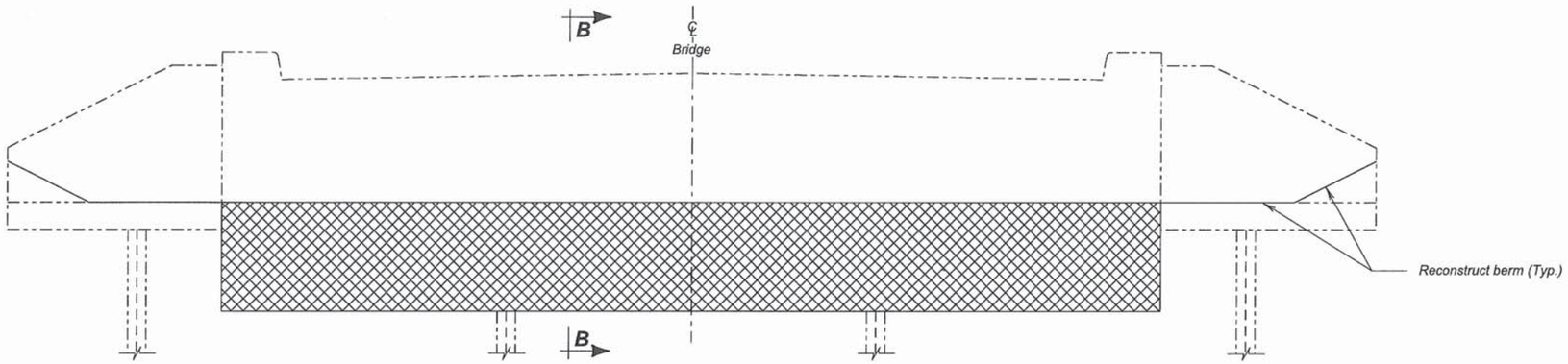
DESIGNED BY:	CK. DES. BY	DRAFTED BY:	
RS	RS	RS	
BUTEI3LP	I3LPxxxx		BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	085-468	43	59



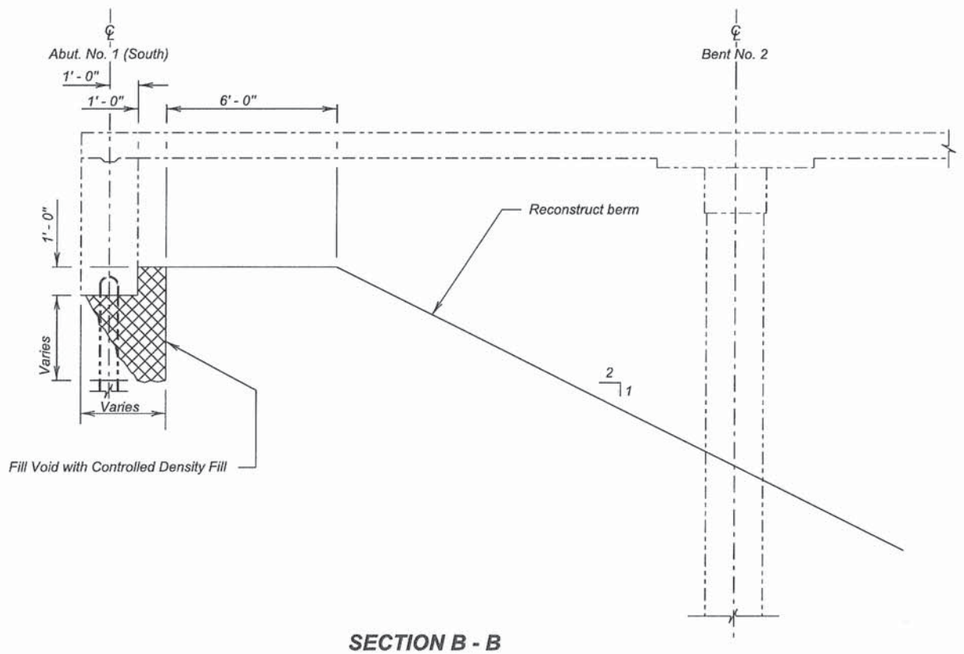
PLAN
Abutment No. 1 (South)

✳ Adjust width as needed to fill void under abument backwall and wingwalls



VIEW A - A

Controlled Density Fill



SECTION B - B

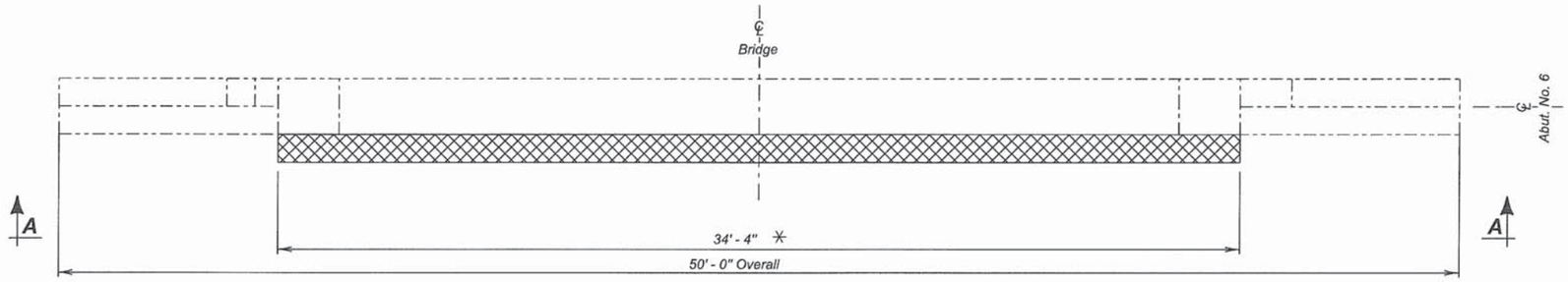
ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY
Controlled Density Fill	Cu.Yd.	9

ABUT. I (SOUTH) BRIDGE BERM DETAILS
FOR
128' - 6" CONT. CONCRETE BRIDGE
30' - 0" ROADWAY — 0° SKEW
OVER BATTLE CREEK — SEC. 6-T12N-R5E
STR. NO. 10-249-129 — 13LP
BUTTE COUNTY
S. D. DEPT. OF TRANSPORTATION
AUGUST 2014

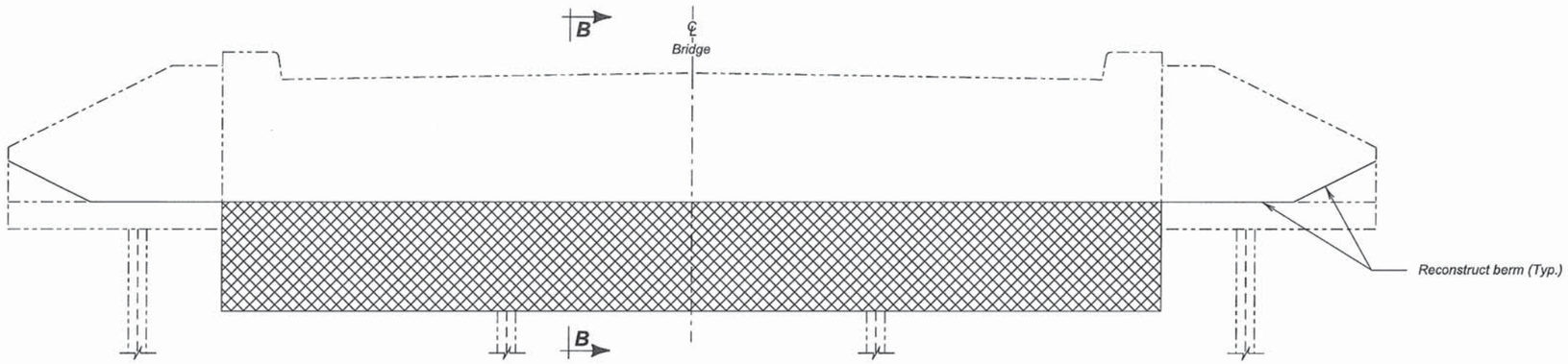
DESIGNED BY	DRAWN BY	CHECKED BY	
RS	RS	RS	
BUTE13LP	13LPXXXX		BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	085-468	44	59



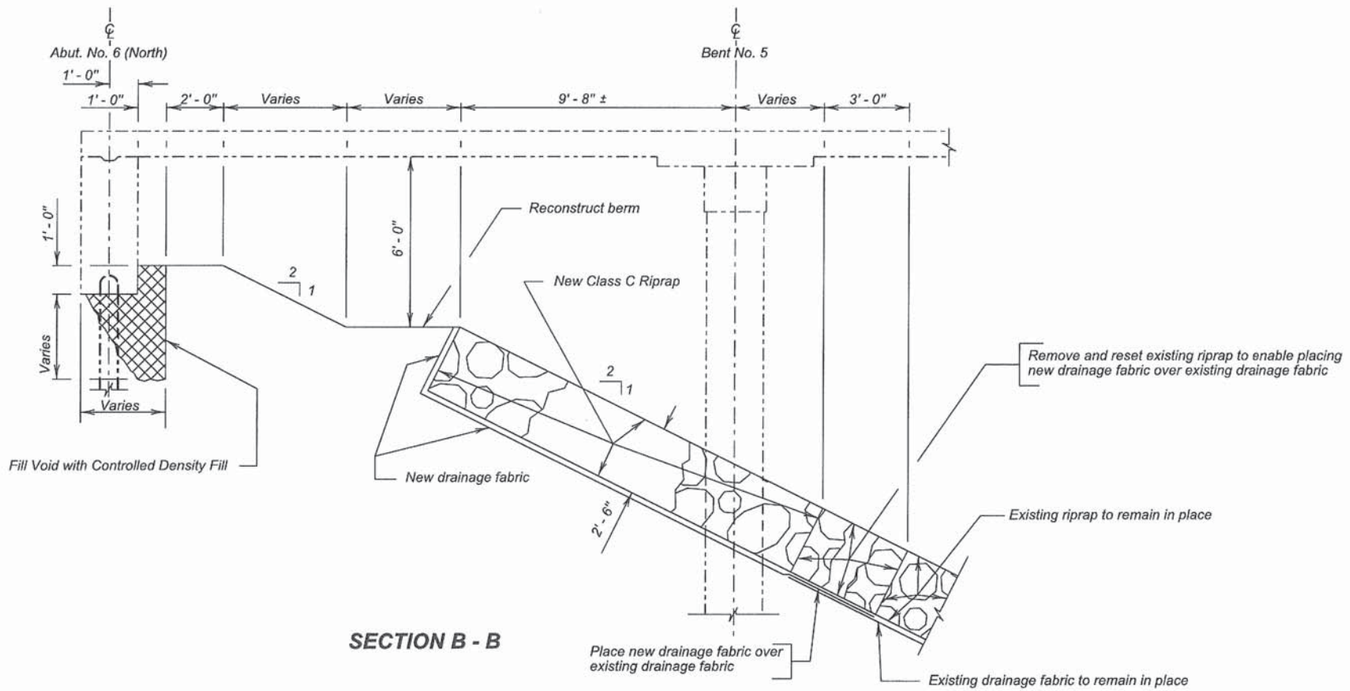
PLAN
Abutment No. 6 (North)

✳ *Adjust width as needed to fill void under abument backwall and wingwalls*



Controlled Density Fill

VIEW A - A



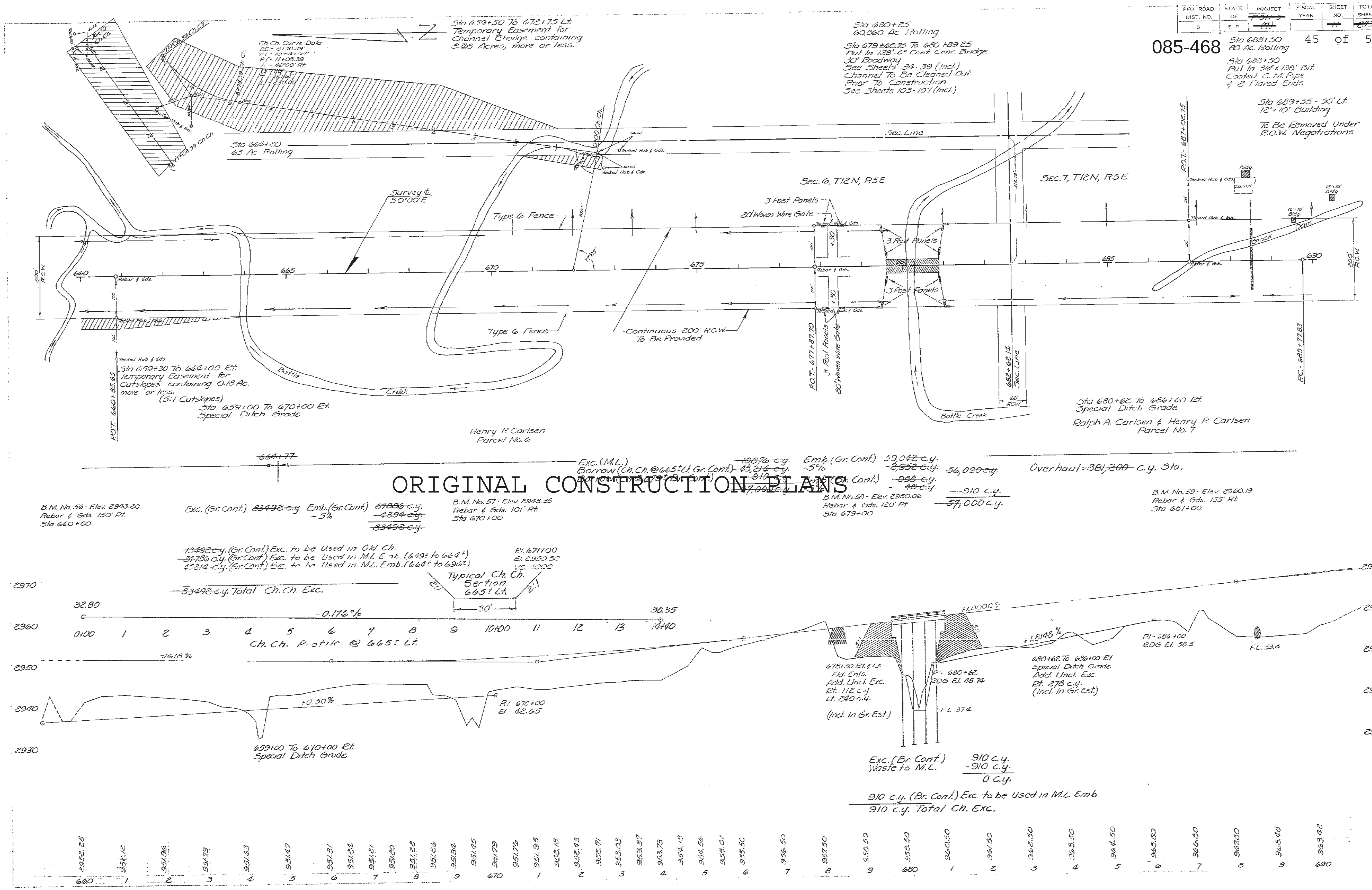
SECTION B - B

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Controlled Density Fill	Cu.Yd.	9

ABUT. 6 (NORTH) BRIDGE BERM DETAILS
FOR
128' - 6" CONT. CONCRETE BRIDGE
30' - 0" ROADWAY — 0° SKEW
OVER BATTLE CREEK — SEC. 6-T12N-R5E
STR. NO. 10-249-129 — 13LP
BUTTE COUNTY
S. D. DEPT. OF TRANSPORTATION
AUGUST 2014

DESIGNED BY	DRAWN BY	CHECKED BY	
RS	RS	RS	BRIDGE ENGINEER
BUTE13LP	13LPXXXX		

ORIGINAL CONSTRUCTION PLANS

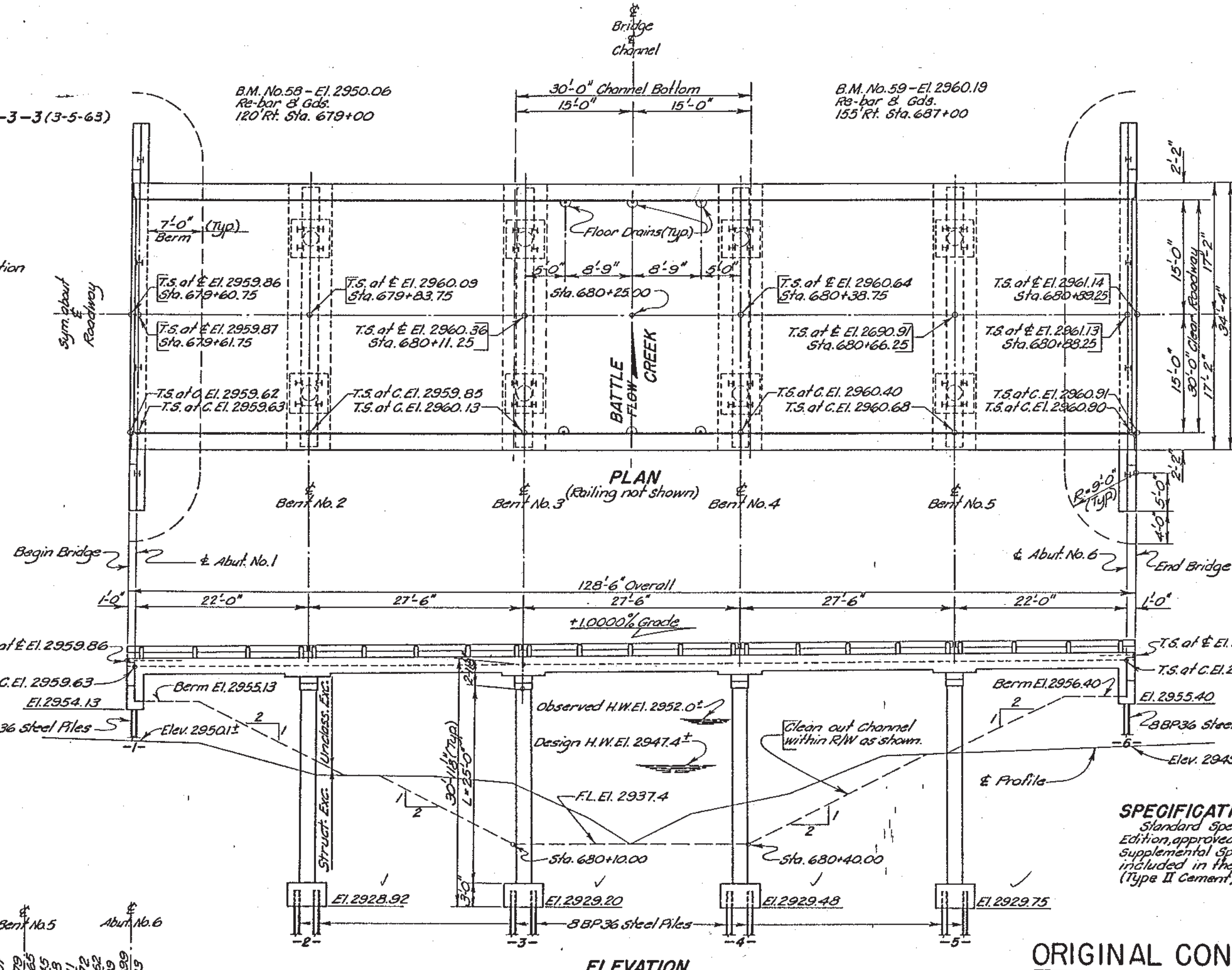


INDEX OF BRIDGE SHEETS—

Sheet No. 1-General Drawing and Quantities
Sheet No. 2-Subsurface Investigations
Sheet No. 3-Details of Abutment
Sheet No. 4-Details of Bent
Sheet No. 5-Details of Superstructure
Sheet No. 6-Details of Type "B" Steel Railing NCS—RB—00—209—3—3 (3-5-63)

NOTE:-
T.S. at C. El. = Top of Slab at Curb Elevation
T.S. at ℄ El. = Top of Slab at Centerline Elevation

Q	3000 c.f.s.
A	500 sq. ft.
V	6.0 f.p.s.

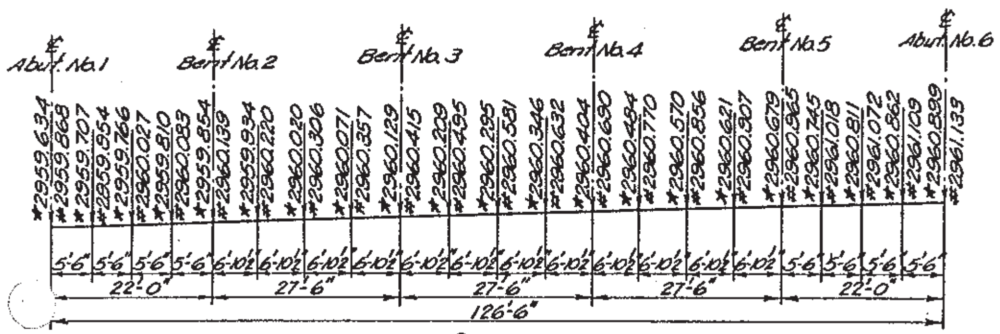


GENERAL NOTES—

1. Place floor drains as shown in plan (6 Required)
2. See NOTES on Sheet No's. 3, 4, 5 and 6.
3. Rail posts shall be built vertical.
4. The contractor shall have sufficient pile splice material on hand before pile driving is started. See Standard Plate No. 301 for Pile Splice Details.
5. Prebored holes for piles at sills shall be backfilled with granular material acceptable to the ENGINEER and compacted as specified by the ENGINEER. The cost of granular material inplace shall be included in the unit price bid for the piles.

SPECIFICATION NOTE—

Standard Specifications for Roads and Bridges 1963 Edition, approved as Std. Sept. 21, 1964, and Required Provisions, Supplemental Specifications and/or Special Provisions as included in the Proposal. All concrete shall be Class "A" (Type II Cement) with air entrainment.



CURB & ℄ ELEVATIONS

Elevations indicated with * are Top of Finished Slab at Curb and with # are Top of Finished Slab at Centerline of Roadway. Camber for Dead Load Deflection PLUS Plastic Flow, shown on Sheet No. 5 of Bridge Plans plus 5/8" at centerline of center spans have been included in the elevations shown above.

F.E. 11-29-66 R.A.V.

ESTIMATED QUANTITIES

ITEM	Class "A" Concrete Cu. Yds.	Steel-Lbs. Reinf.	Steel-Lbs. Struct.	Type "B" Steel Railing-Lin. Ft.	Steel Bearing Piles ϕ 8 BP36-Lbs.	Excavation-Cu. Yds. Struct.	Excavation-Cu. Yds. ΔUnclass.
Superstructure	170.7 170.66	46,705	105	259.3			
Abutments No. 1 & No. 6	35.8 35.88	4,300	200		8@40'×36#=11,520	20	
Bents No. 2, 3, 4, & 5	63.6 63.48	18,600			32@18'×36#=20,736	260	
Totals	270.1 270.4	69,605	305	259.3	ϕ 32,256	280	Δ

ϕ One 8BP36 Steel Bearing Test Pile shall be driven at Abutments No. 1 and No. 6 and at Bents No. 2, 3, 4 and 5.
Δ See Grading Plans for Unclassified Excavation.
PILE NOTE: Pre-bored holes through the fill shall be not less than 10".

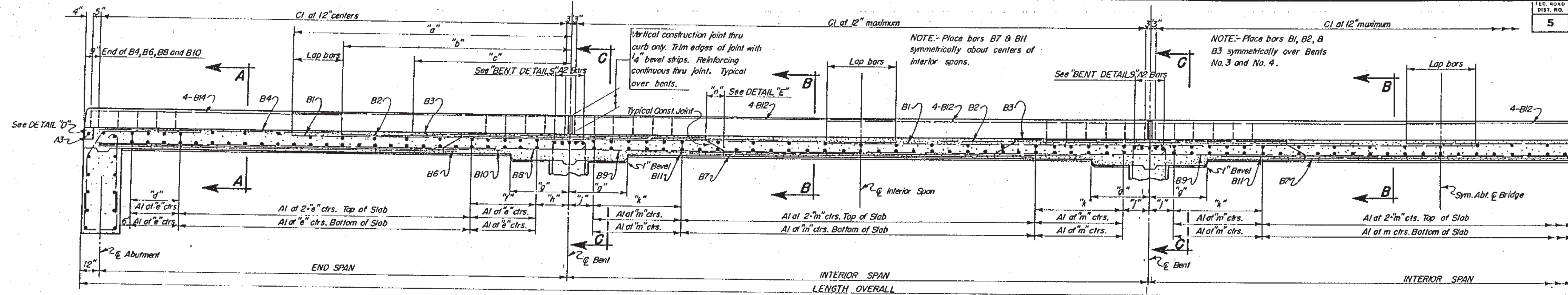
Item	Str. Exc.	8BP36 L.F.	8BP36 Lbs.
Abt. 1	10.05	155.2	5587.2
B 2	91.07	132.9	4784.4
B 3	40.00	148.6	5350.6
B 4	38.60	207.9	7484.4
B 5	93.6	175.5	6318.0
Abt. 6	9.85	169.3	6094.8
Total	282.60	989.6	35,625.6

ORIGINAL CONSTRUCTION PLANS

GENERAL DRAWING AND QUANTITIES
FOR
128'-6" CONTINUOUS CONCRETE BRIDGE
ON U.S. NO. 85 — 30'-0" ROADWAY
OVER BATTLE CREEK — SEC. 6-T12N-R5E
STA. 679+60.75 TO 680+89.25 — ~~F011-5(7)~~
BUTTE COUNTY
STR. NO. 10-249-129 — SOUTH DAKOTA — HS20-44
DEPARTMENT OF HIGHWAYS
JULY 1964 10 ~~5~~ OF ~~10~~ 18

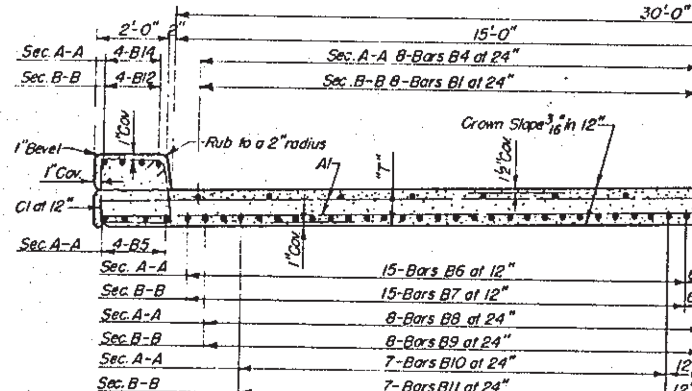
—X020—

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
J.B.S.	G.A.	E.L.S.	BRIDGE ENGINEER

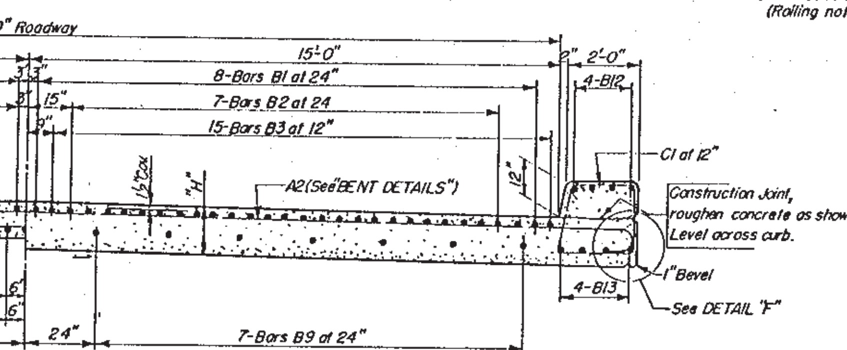


HALF LONGITUDINAL SECTIONAL VIEW

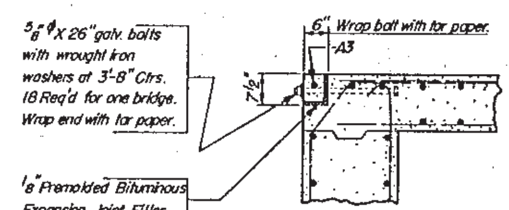
(Rolling not shown)



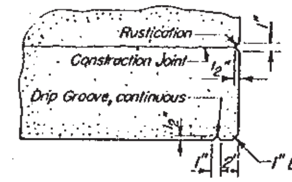
SECTION A-A
SECTION B-B — As shown and noted.



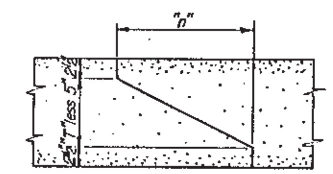
SECTION C-C



DETAIL "D"



DETAIL "F"



DETAIL "E"
(TYPICAL CONSTRUCTION JOINT)

— NOTES —

These notes cover Abutment, Superstructure, and Railing Details. The General Drawing for each structure will show spans, elevations, and other necessary notes and details.

DESIGN SPECIFICATIONS: A.A.S.H.O. Specifications for Highway Bridges, 1961, with Interim Specifications for 1961, 1962 and ① 1963.

PILING: See General Drawing for type and length of Abutment piling.

STRUCTURAL STEEL: All 5/8" φ bolts including washers, and all pile connections in Abutments, and all floor drains shall be paid for as Structural Steel.

REINFORCING STEEL: All Reinforcing Steel shall conform to A.S.T.M. Specifications A305 and A15 (Intermediate Grade)

CONCRETE: Class "A" Concrete shall develop a minimum allowable compressive strength of 4,000 p.s.i. at 28 days. All exposed concrete corners and edges shall be chamfered to a 3/4" bevel unless noted otherwise. If necessary to facilitate construction, transverse construction joints may be made at the quarter points of each and any span, adjacent to interior bents. All costs for expansion joint filler and tar paper shall be included in the unit price bid per cu. yd. for Class "A" Concrete.

DESIGN DATA: Design Loading: H20-S16-44 A.A.S.H.O. Unit stresses: Concrete f_c = 1600 p.s.i., n = 8; Reinforcing Steel f_s = 20,000 p.s.i. (Int. Grade Steel). Equivalent fluid pressure of earth at 40#/sq. ft. Minimum Pile Loading = 24 tons for Timber Piling and ① 45 tons for 8BP36 Steel Bearing Piles (values for one pile).

SLAB DATA

REINFORCING SCHEDULE

LENGTH OVERALL	END SPAN	INTERIOR SPAN	A1 No.	A1 Size	A1 Length	A2	A3 No.	A3 Size	A3 Length	B1 No.	B1 Size	B1 Length	B2 No.	B2 Size	B2 Length	B3 No.	B3 Size	B3 Length	B4 No.	B4 Size	B4 Length
94'-0"	16'	20'	152	5	33'-9"	See "BENT DETAILS" for Number, Length, Size and Quantity.	2	5	29'-9"	64	8	22'-6"	56	8	17'-0"	120	7	10'-0"	32	7	8'-0"
105'-6"	18'	22'-6"	176								8	24'-0"		8	18'-0"		8	11'-9"		7	9'-6"
117'-0"	20'	25'	196								8	26'-0"		8	19'-6"		8	13'-6"		7	11'-0"
128'-6"	22'	27'-6"	215								9	28'-0"		8	20'-0"		8	14'-6"		8	12'-6"
140'-0"	24'	30'	242								9	31'-0"		9	22'-6"		8	15'-0"		8	12'-6"
151'-6"	26'	32'-6"	261								9	34'-0"		9	24'-6"		9	17'-0"		8	15'-0"
163'-0"	28'	35'	281								10	35'-0"		9	24'-6"		9	18'-0"		9	15'-0"
174'-6"	30'	37'-6"	340								10	36'-6"		10	26'-0"		9	18'-0"		9	17'-0"
186'-0"	32'	40'	362								10	39'-0"		10	27'-6"		10	19'-6"		9	17'-6"
197'-6"	34'	42'-6"	386								10	40'-0"		10	30'-0"		10	23'-0"		9	19'-6"
209'-0"	36'	45'	410	5	33'-9"		2	5	29'-9"	64	10	42'-6"	56	10	30'-0"	120	10	23'-0"	32	9	21'-0"

LENGTH OVERALL	B5 No.	B5 Size	B5 Length	B6 No.	B6 Size	B6 Length	B7 No.	B7 Size	B7 Length	B8 No.	B8 Size	B8 Length	B9 No.	B9 Size	B9 Length	B10 No.	B10 Size	B10 Length
94'-0"	16	6	16'-9"	60	8	14'-0"	90	8	13'-9"	30	8	16'-3"	45	8	20'-0"	28	7	15'-3"
105'-6"		7	18'-9"		8	15'-6"		8	16'-0"		8	18'-3"		8	22'-6"		7	16'-9"
117'-0"		7	20'-9"		8	16'-6"		8	16'-0"		8	20'-3"		8	25'-0"		8	18'-6"
128'-6"		8	22'-9"		8	17'-6"		8	17'-0"		9	22'-3"		9	27'-6"		8	19'-0"
140'-0"		8	24'-9"		8	18'-6"		8	17'-6"		9	24'-3"		9	30'-0"		9	20'-9"
151'-6"		9	26'-9"		9	20'-6"		9	20'-0"		9	26'-3"		9	32'-6"		8	21'-6"
163'-0"		9	28'-9"		9	21'-6"		9	20'-6"		9	28'-3"		9	35'-0"		9	23'-6"
174'-6"		9	30'-9"		9	23'-0"		9	20'-6"		10	30'-3"		10	37'-6"		9	24'-6"
186'-0"		10	32'-9"		9	23'-6"		9	20'-0"		10	32'-3"		10	40'-0"		10	26'-0"
197'-6"		10	34'-9"		9	25'-0"		9	21'-6"		10	34'-3"		10	42'-6"		10	27'-6"
209'-0"	16	11	36'-9"	60	10	27'-0"	90	10	24'-6"	30	10	36'-3"	45	10	45'-0"	28	9	29'-0"

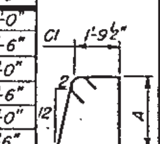
LENGTH OVERALL	B11 No.	B11 Size	B11 Length	B12 No.	B12 Size	B12 Length	B13 No.	B13 Size	B13 Length	B14 No.	B14 Size	B14 Length	C1 No.	C1 Size	C1 Length	C1 Type	C1 A
94'-0"	42	7	17'-0"	32	6	22'-6"	24	6	20'-0"	16	6	8'-6"	198	4	8'-0"	T1	1'-7¼"
105'-6"		7	19'-0"		7	24'-0"		7	22'-6"		7	10'-0"	218		8'-0"		1'-7¾"
117'-0"		8	20'-6"		7	26'-0"		7	25'-0"		7	11'-6"	244		8'-3"		1'-8¼"
128'-6"		8	21'-0"		8	28'-0"		8	27'-6"		8	13'-0"	264		8'-3"		1'-8¾"
140'-0"		9	22'-6"		8	31'-0"		8	30'-0"		8	13'-0"	290		8'-3"		1'-9"
151'-6"		8	23'-0"		9	32'-0"		9	32'-6"		8	15'-6"	310		8'-6"		1'-9¾"
163'-0"		9	24'-6"		9	35'-0"		9	35'-0"		8	15'-6"	336		8'-6"		1'-10½"
174'-6"		9	25'-0"		9	36'-6"		9	37'-6"		8	17'-6"	356		8'-9"		1'-11"
186'-0"		10	26'-0"		10	39'-0"		10	40'-0"		8	18'-0"	382		8'-9"		1'-11½"
197'-6"		10	27'-0"		10	40'-6"		10	42'-6"		8	20'-0"	402		9'-0"		2'-0¼"
209'-0"	42	9	28'-6"	32	11	42'-6"	24	11	45'-0"	16	8	21'-6"	428	4	9'-0"	T1	2'-1"

DIMENSIONS

"T"	"H"	"a"	"b"	"c"	"d"	"e"	"f"	"g"	"h"	"j"	"k"	"m"	"n"	LENGTH OVERALL
9¼"	12½"	11'-0"	8'-3"	4'-9"	1'-8"	10"	1'-8"	2'-0"	1'-2"	1'-9"	2'-9"	11"	7¾"	94'-0"
9¾"	13¼"	11'-3"	9'-9"	6'-3"	1'-8"	10"	1'-8"	2'-3"	1'-6"	1'-2"	2'-9"	11"	8½"	105'-6"
10¼"	14"	12'-0"	10'-6"	7'-0"	2'-6"	10"	2'-6"	2'-6"	1'-10"	1'-6"	3'-8"	11"	9½"	117'-0"
10¾"	14¾"	12'-6"	11'-0"	7'-6"	2'-6"	10"	3'-4"	2'-9"	1'-4"	1'-10"	3'-8"	11"	10½"	128'-6"
11"	15"	14'-3"	11'-9"	8'-0"	2'-6"	10"	3'-4"	3'-0"	1'-8"	1'-3"	4'-7"	11"	10¼"	140'-0"
11¾"	16"	16'-0"	12'-9"	9'-0"	3'-4"	10"	3'-4"	3'-3"	1'-2"	1'-7"	4'-7"	11"	1'-0¼"	151'-6"
12½"	17"	15'-9"	12'-9"	9'-3"	4'-2"	10"	4'-2"	3'-6"	1'-6"	1'-11"	5'-6"	11"	1'-1½"	163'-0"
13"	17¾"	16'-0"	13'-6"	9'-6"	4'-6"	9"	4'-6"	3'-9"	1'-6"	1'-3"	5'-10"	10"	1'-2½"	174'-6"
13½"	18¼"	17'-3"	14'-3"	10'-3"	4'-6"	9"	5'-3"	4'-0"	1'-3"	1'-8"	6'-8"	10"	1'-3¼"	186'-0"
14¼"	19¼"	17'-6"	15'-0"	11'-9"	4'-6"	9"	5'-3"	4'-3"	1'-9"	1'-3"	6'-8"	10"	1'-4¾"	197'-6"
15"	20¼"	18'-0"	15'-3"	11'-9"	6'-0"	9"	6'-0"	4'-6"	1'-6"	1'-8"	7'-6"	10"	1'-6"	209'-0"

BAR BENDS

NOTE: All dimensions are out to out of bars.



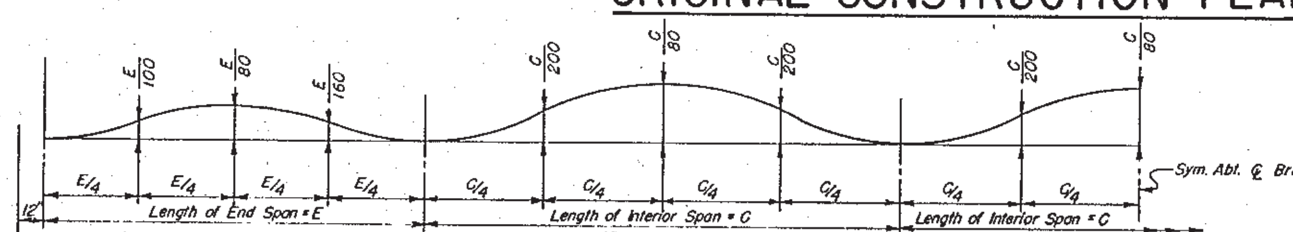
Type T1

ESTIMATED QUANTITIES

LENGTH OVERALL	TWO ABUTMENTS: Class "A" Concrete * Cu Yds.	TWO ABUTMENTS: Reinforcing Steel Lbs.	TIMBER PILES: Number of Piles	TIMBER PILES: Struct Steel Lbs.	STEEL PILES: Number of Piles	STEEL PILES: Struct Steel Lbs.	SLABS & CURBS: Class "A" Concrete Cu. Yds.	SLABS & CURBS: Reinforcing Steel Lbs.	SLABS & CURBS: 5/8" φ Bolts	SLABS & CURBS: Number of Floor Drains	SLABS & CURBS: Structural Steel Lbs.
94'-0"	358	4300	14	664	12	400	107.8	29,826	18	20	216
105'-6"			14	664	12	400	127.5	35,298		[illegible]	275
117'-0"			14	664	12	400	148.4	39,487		26	284
128'-6"			16	760	① 8	① 200	170.7	46,705		① 6	① 105
140'-0"			16	760	12	400	190.0	52,687		30	334
151'-6"			16	760	14	468	218.5	61,680		36	410
163'-0"			18	854	14	468	248.9	68,662		36	426
174'-6"			18	854	14	468	276.7	77,107		36	438
186'-0"			20	950	16	534	305.0	87,556		40	494
197'-6"			20	950	16	534	340.5	94,045		46	583
209'-0"	358	4300	20	950	16	534	378.0	103,851	18	46	605

* Includes slabs and curbs directly over abutment.

ORIGINAL CONSTRUCTION PLANS



CAMBER DIAGRAM

Camber is calculated for dead load plus plastic flow. Camber is calculated thus using the 186'-0" Bridge as an illustration: E=32' and C=40'; C/80 = 40/80 = 1/2, provide 1/2" camber at center of interior spans. The values obtained for camber shall be added to the proposed grade elevations of the respective stations to establish the elevations of the top of the finished roadway slab.

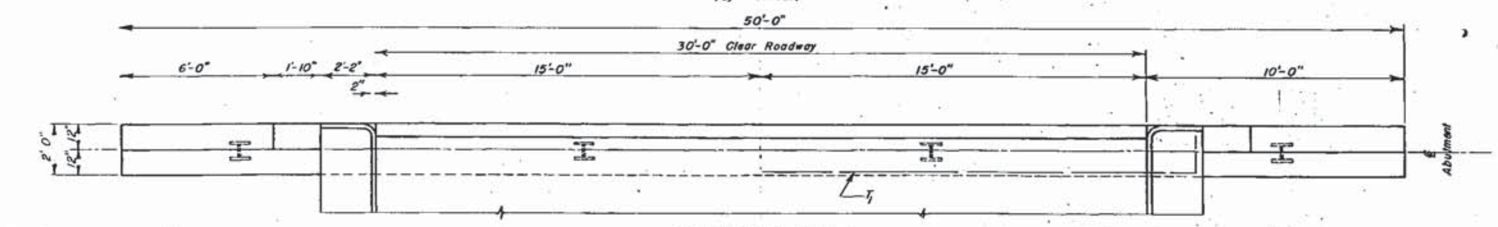
Rev. from Std. NCCS-30-00-209-1-2 (7/29/64)

DETAILS OF SUPERSTRUCTURE FOR
128'-6" CONTINUOUS CONCRETE BRIDGE
ON U.S. NO. 85 — 30'-0" ROADWAY
OVER BATTLE CREEK — SEC. 6-T12N-R
STA. 679+60.75 TO 680+89.25 — ~~F 011-5(7)~~
BUTTE COUNTY
STR. NO. 10-249-129 — SOUTH DAKOTA — HS20-44
DEPARTMENT OF HIGHWAYS
JULY 1964 11 ~~⑥~~ OF ~~⑩~~ 18

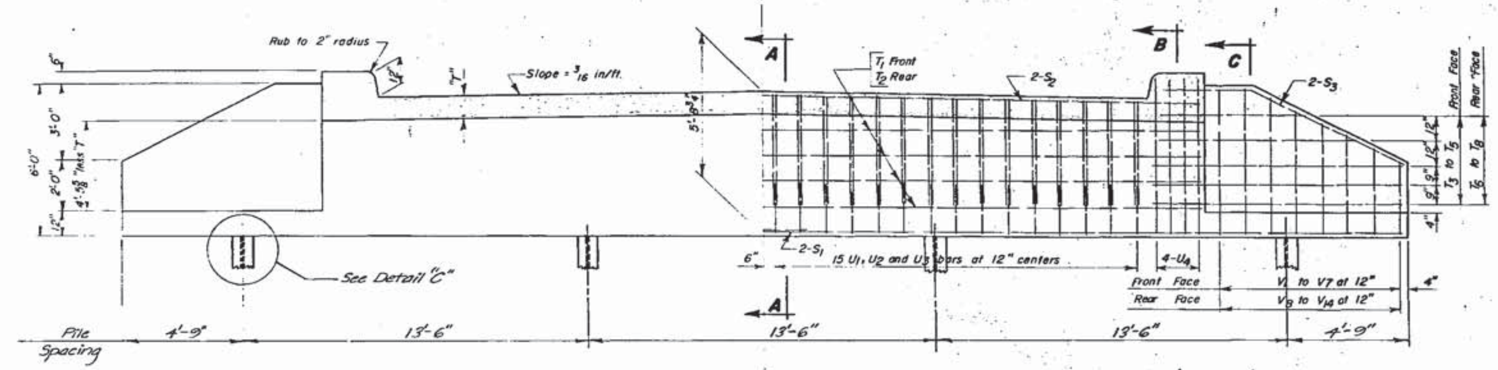
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
CHJ./M.S.S.	J.L.H.	R.C.M.	[illegible] BRIDGE ENGINEER

085-468

FED. ROAD DIST. NO.	STATE		FISCAL YEAR	SHEET NO.	TOTAL
5	S.D.	~~F011-5(7)~~		~~38~~	~~51~~



ABUTMENT PLAN

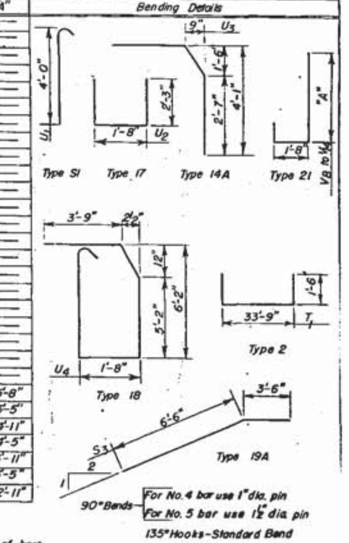


ABUTMENT ELEVATION

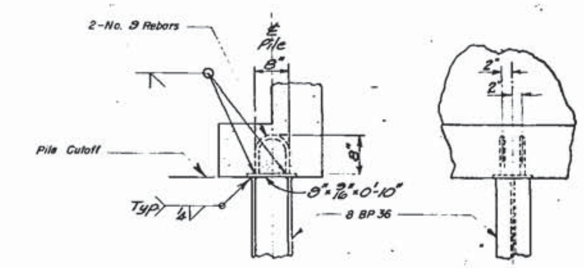
REINFORCING SCHEDULE
(For One Abutment)

MK	No.	Size	Length	Type	"A"
S_1	4	9	26'-6"	Str.	—
*S_2	2	9	34'-0"	Str.	—
S_3	4	9	10'-0"	19A	—
T_1	4	5	36'-9"	2	—
T_2	4	5	34'-0"	Str.	—
T_3	6	4	9'-9"	Str.	—
T_4	2	4	7'-9"	Str.	—
T_5	2	4	5'-9"	Str.	—
T_6	6	5	10'-0"	Str.	—
T_7	2	5	8'-0"	Str.	—
T_8	2	5	6'-0"	Str.	—
U_1	30	4	4'-6"	S1	—
U_2	30	4	6'-3"	17	—
U_3	30	6	9'-6"	14A	—
U_4	8	6	18'-6"	18	—
V_1	4	4	5'-0"	Str.	—
V_2	2	4	4'-6"	Str.	—
V_3	2	4	4'-0"	Str.	—
V_4	2	4	3'-6"	Str.	—
V_5	2	4	3'-0"	Str.	—
V_6	2	4	2'-6"	Str.	—
V_7	2	4	2'-0"	Str.	—
V_8	4	4	8'-0"	21	5'-8"
V_9	2	4	7'-9"	21	5'-5"
V_{10}	2	4	7'-3"	21	4'-11"
V_{11}	2	4	6'-9"	21	4'-5"
V_{12}	2	4	6'-3"	21	3'-11"
V_{13}	2	4	5'-9"	21	3'-5"
V_{14}	2	4	5'-3"	21	2'-11"

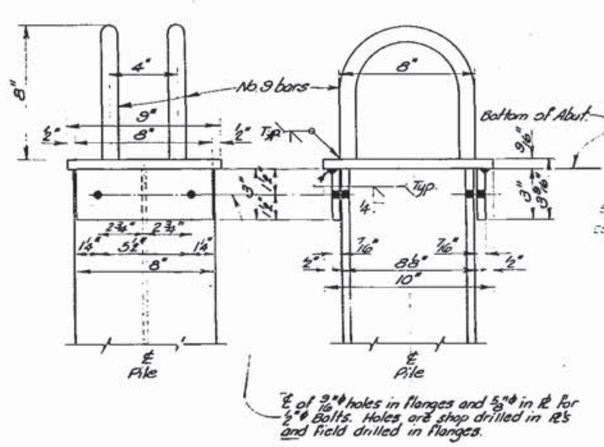
Bending Details



*Bend in field if necessary.
Note:- All dimensions are out to out of bars.

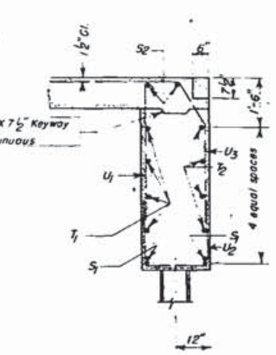


DETAIL "C"

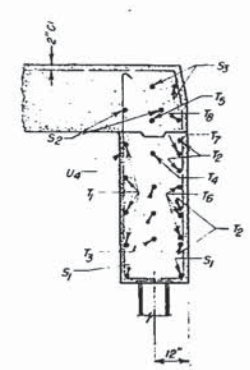


ALTERNATE PILE CONNECTION DETAILS

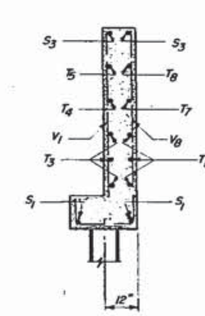
Note:- Structural weight of pile connection is based on 25 lbs per pile regardless of type used.



SECTION A-A



SECTION B-B



SECTION C-C

Note:- Use 2" Clear cover on all reinforcing except as shown

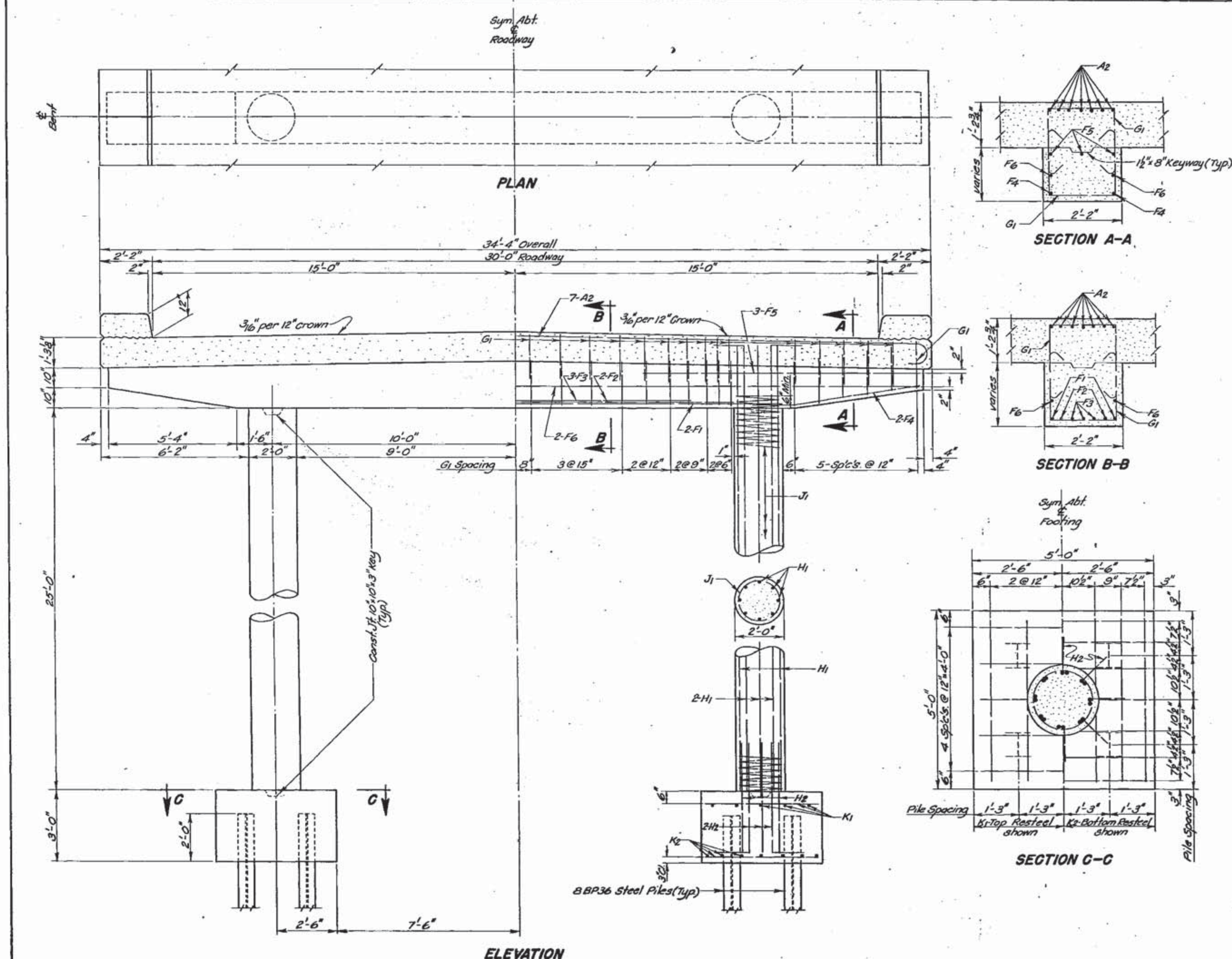
Revised Pile Spacing from NCCS-30-00-209-2-2 (7/22/64) WCP
♦Rev Note: 12-20-63 (RCM)

ORIG. CONSTR. PLANS
STR. NO. 10-249-129
DETAILS OF ABUTMENT
FOR
128'-6" CONTINUOUS CONCRETE BRIDGE

ON U.S. NO. 85 — 30'-0" ROADWAY
OVER BATTLE CREEK — SEC. 6-T12N-R5E
STA. 679+60.75 TO 680+89.25 — ~~F011-5(7)~~
BUTTE COUNTY
SOUTH DAKOTA — HS20-44
DEPARTMENT OF HIGHWAYS
JULY 1964 — 12 ~~3~~ OF ~~6~~ 18

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
CHJ., M.B.S.	[illegible]	R.C.M.	[signature] BRIDGE ENGINEER

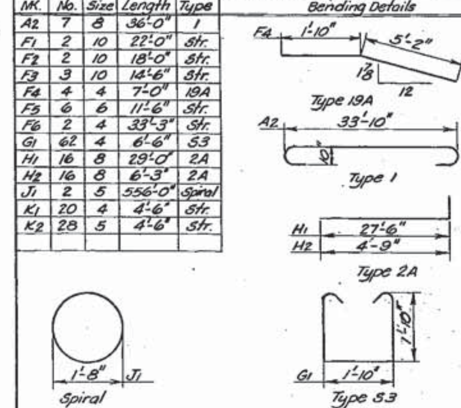
Y
10-391/392/398/399



REINFORCING SCHEDULE
(For One Bent)

MK.	No.	Size	Length	Type
A2	7	8	36'-0"	1
F1	2	10	22'-0"	Str.
F2	2	10	18'-0"	Str.
F3	3	10	14'-6"	Str.
F4	4	4	7'-0"	19A
F5	6	6	11'-6"	Str.
F6	2	4	33'-3"	Str.
G1	62	4	6'-6"	53
H1	16	8	29'-0"	2A
H2	16	8	6'-3"	2A
J1	2	5	556'-0"	Spiral
K1	20	4	4'-6"	Str.
K2	28	5	4'-6"	Str.

Bending Details



Spirals - 3" pitch, 1½ extra turns at each end, splice as required, using a lap of 1½ turns. Use 4 vertical spacer bars per column. Weight of spacer bars included in resteel estimate.

NOTE:- All dimensions are out to out of bars.

ESTIMATED QUANTITIES
(For One Bent)

ITEM	UNIT	QUANTITY
Class "A" Concrete	Cu. Yds.	15.9
^Δ^Reinforcing Steel	Lbs.	4650
8BP36	No.	8
Structure Exc.	Cu. Yds.	*

Δ Includes weight of spacer bars. Each spacer bar is computed at ¾ Lbs. per Lin. Ft. regardless of type furnished.
* See General Drawing.

GENERAL NOTES—

1. Use 2" clear cover on all reinforcing steel except as shown.
2. Piling shall develop a minimum bearing value of 45 Tons per pile.
3. See General Drawing for lengths of Steel Bearing Piles.
4. Unit Stresses: Re-Steel fs = 20,000 p.s.i.
   Concrete fc = 1,600 p.s.i.
5. All reinforcing steel bars shall conform to A.S.T.M. Specifications A305 and A15 Intermediate Grade, except Spirals may be smooth bars.
6. Substructure shoring shall remain in place until Superstructure shoring is removed.

ORIG. CONSTR. PLANS
STR. NO. 10-249-129

DETAILS OF BENT
FOR
128'-6" CONTINUOUS CONCRETE BRIDGE

ON U.S. NO. 85 — 30'-0" ROADWAY
OVER BATTLE CREEK — SEC. 6-T12N-R5E
STA. 679+60.75 TO 680+89.25 — ~~F011-5(7)~~
BUTTE COUNTY
SOUTH DAKOTA — HS20-44
DEPARTMENT OF HIGHWAYS
JULY 1964 13 ~~4~~ OF ~~6~~ 18

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
J.B.S.	G.A.	E.L.G.	[signature] BRIDGE ENGINEER

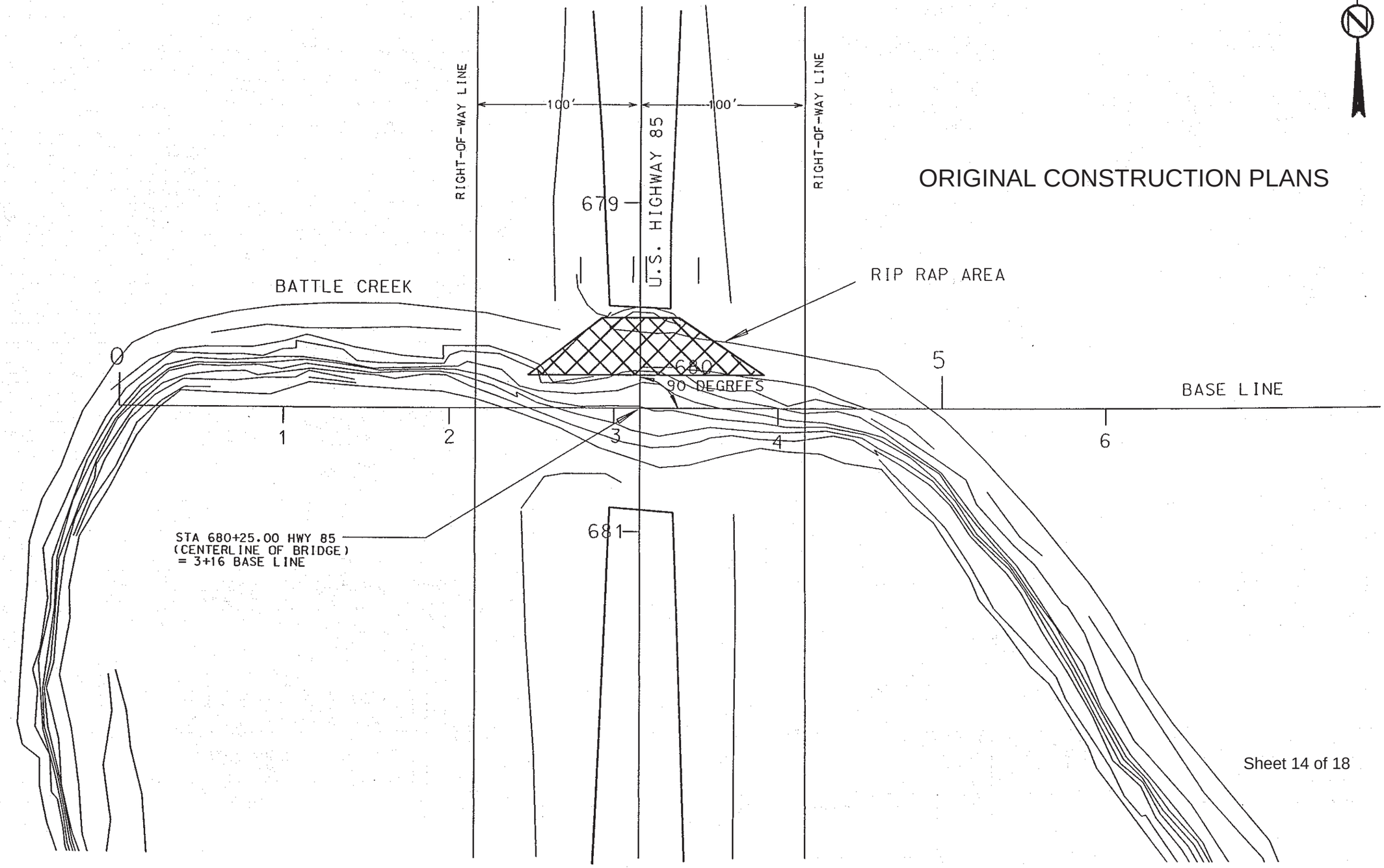
10/391/392/398/27?

STA 2+50 TO STA 3+90 LT.
(BASELINE STATIONING)
RESTORE BERM
SEE CROSS SECTIONS

STA 2+50 TO STA 3+90 LT.
(BASELINE STATIONING)
INSTALL RIPRAP

FED. HWY. ADMIN. NO.	STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
8	S.D.	~~NH 0085(00)72~~	~~5~~	~~15~~

085-468 50 of 59



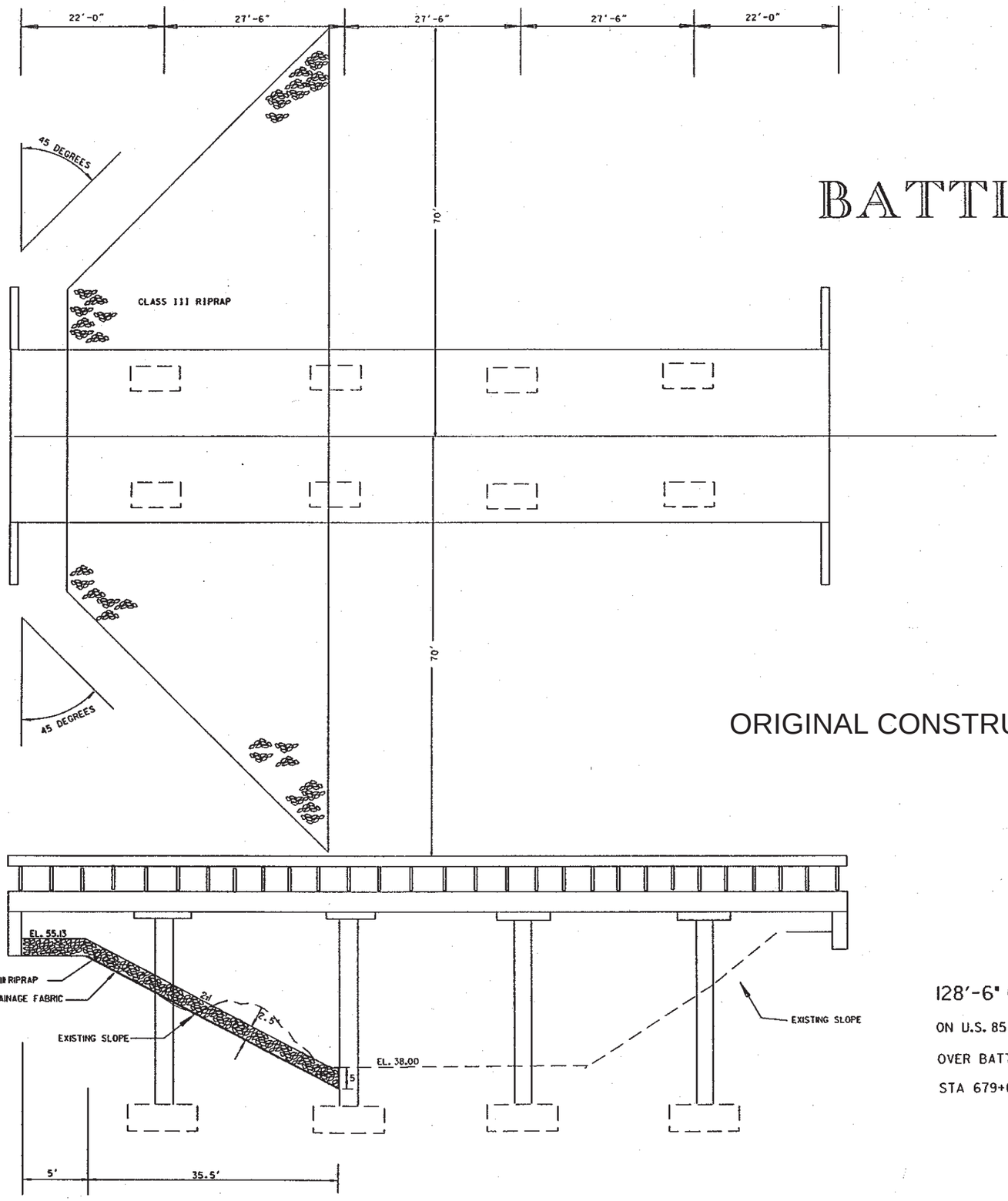
ORIGINAL CONSTRUCTION PLANS

Sheet 14 of 18

FED.HWY. ADMIN.NO.	STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
8	S.D.	~~NH 0085(00)72~~	~~6~~	~~15~~

085-468 51 of 59

BATTLE CREEK



ORIGINAL CONSTRUCTION PLANS

RIP RAP DETAILS
128'-6" CONTINUOUS CONCRETE BRIDGE

ON U.S. 85 — 30' - 0" ROADWAY

OVER BATTLE CREEK — SEC. 6 - T12N - R5E

STA 679+60.75 TO 680+89.25 — STR. NO. 10-249-129

BUTTE COUNTY
SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION

Sheet 15 of 18

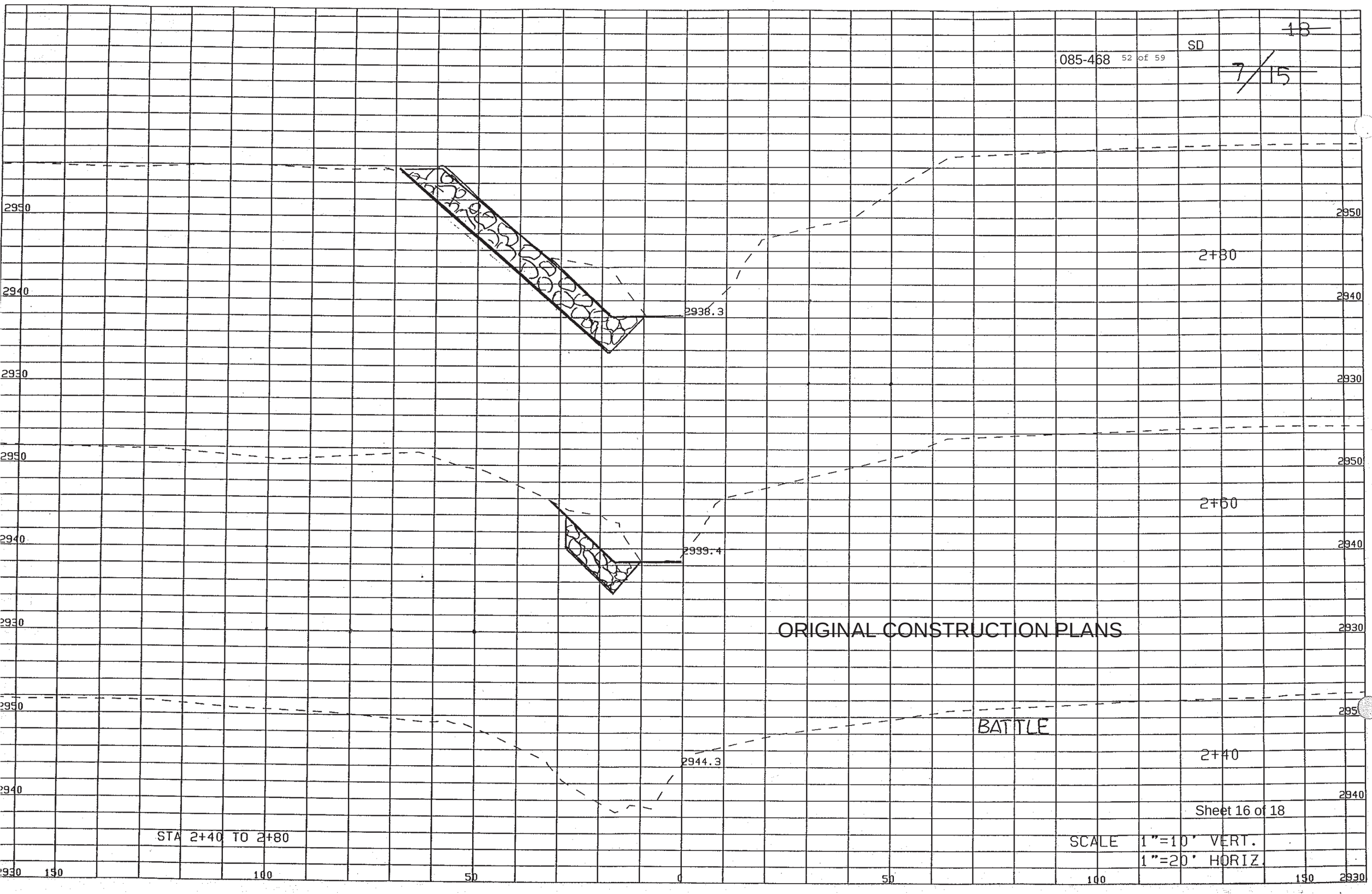
DRAWN BY: DATE: CHECKED BY: DATE:

18

SD

085-468 52 of 59

7/15



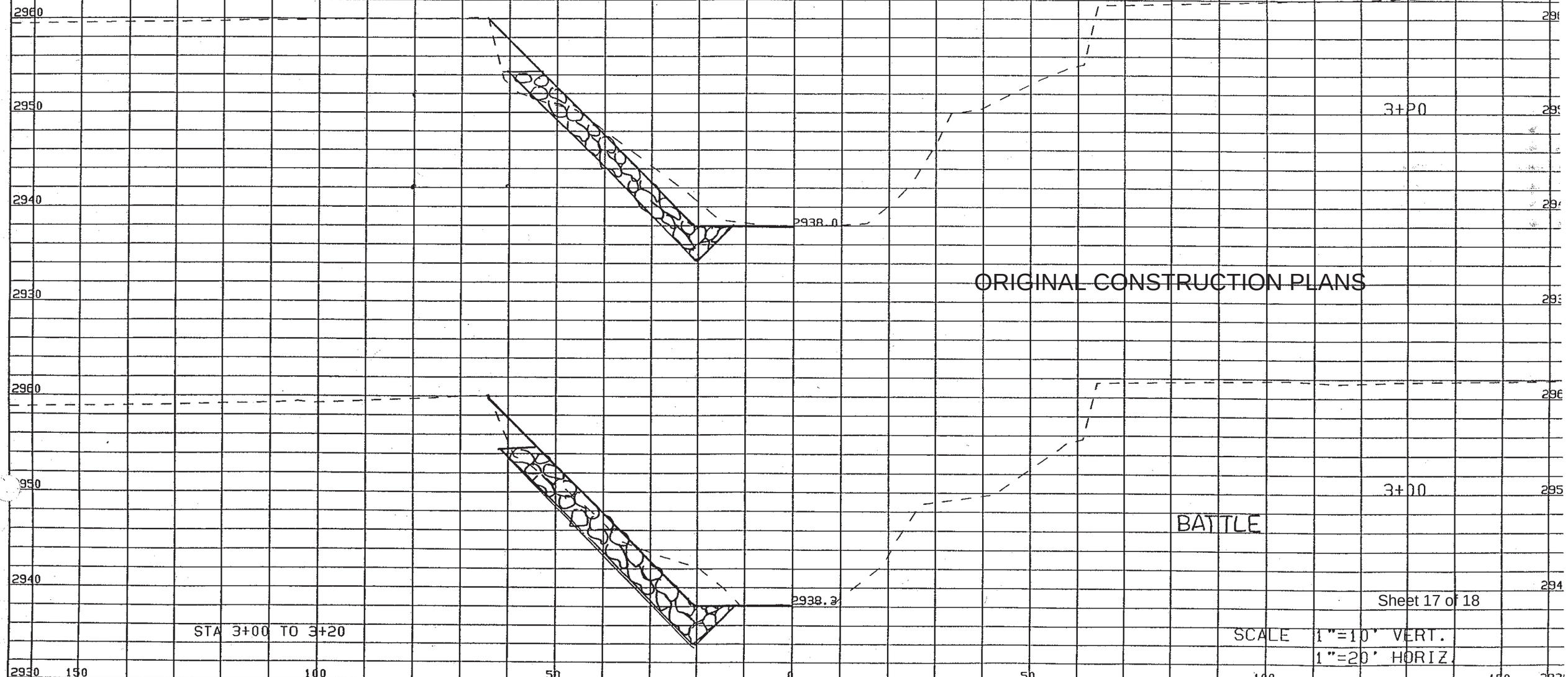
ORIGINAL CONSTRUCTION PLANS

Sheet 16 of 18

SD

~~19~~

~~8/15~~

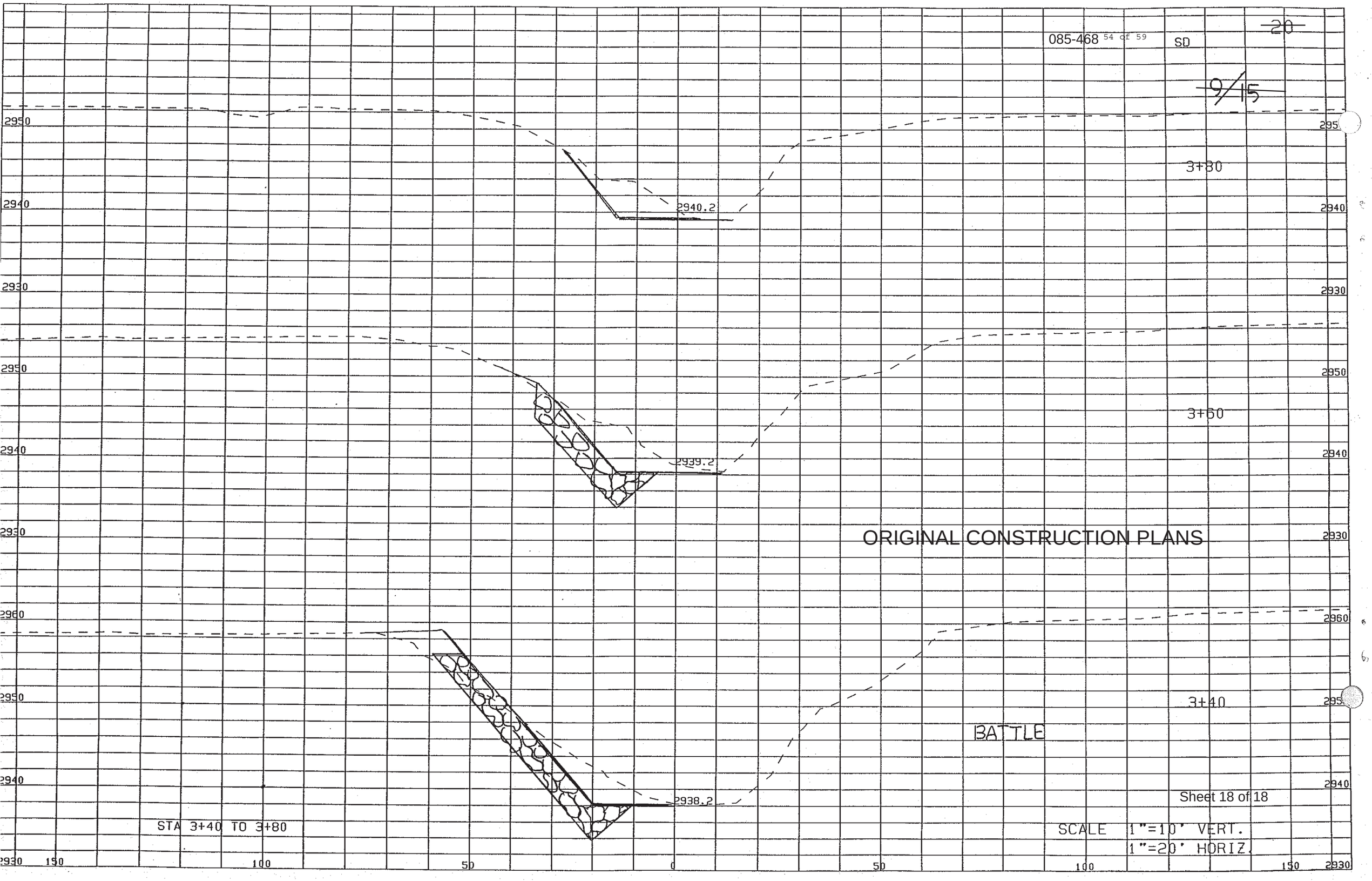


ORIGINAL CONSTRUCTION PLANS

085-468 54 of 59 SD

~~20~~

~~9/15~~



ORIGINAL CONSTRUCTION PLANS

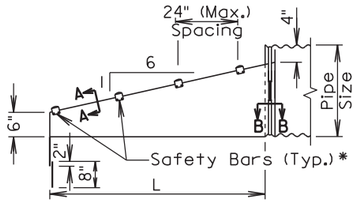
BATTLE

STA 3+40 TO 3+80

SCALE 1"=10' VERT.
1"=20' HORIZ.

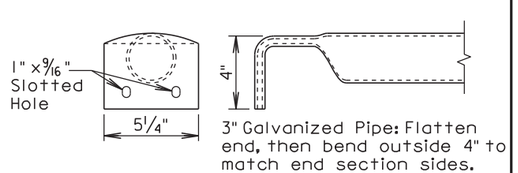
Sheet 18 of 18

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	085-468	55	59

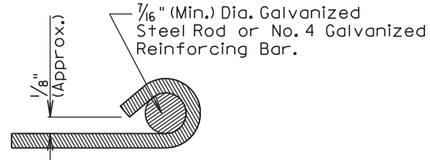


ELEVATION VIEW

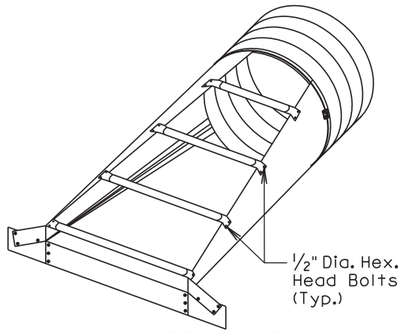
*Number of bars required will vary depending on the length of the end section.



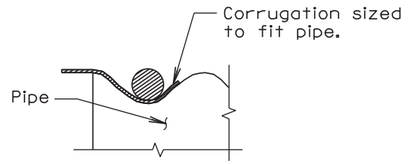
DETAIL OF SAFETY BARS



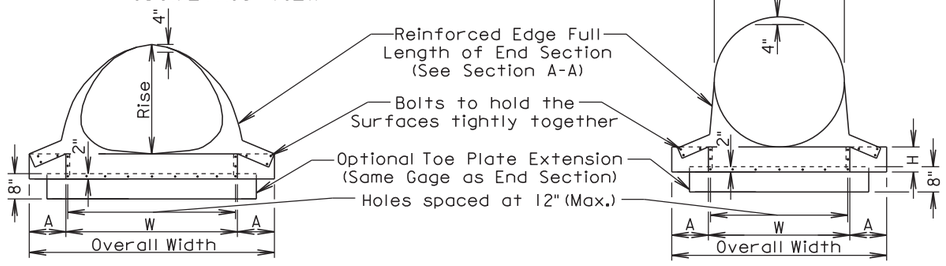
SECTION A-A



ISOMETRIC VIEW

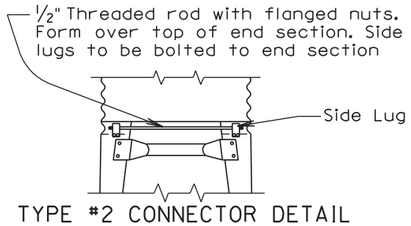


SECTION B-B

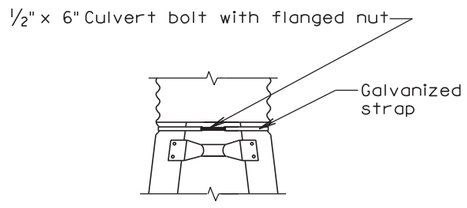


FRONT VIEW

FRONT VIEW



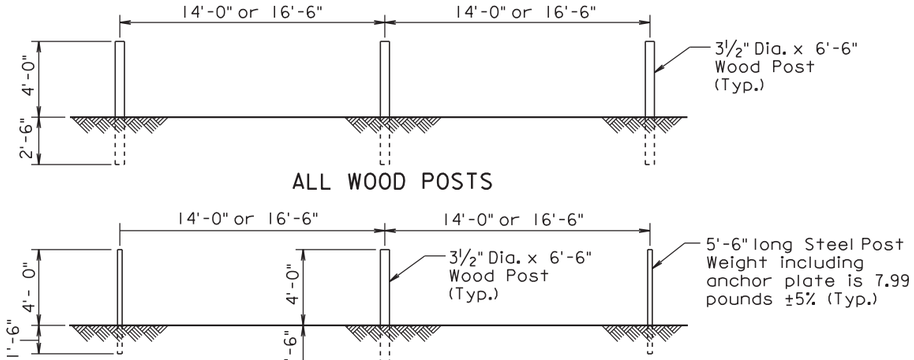
TYPE #2 CONNECTOR DETAIL
(For 30" and Larger)
(For 21" X 15" and Larger)



TYPE #1 CONNECTOR DETAIL
(For 15" Through 24")

August 31, 2013

Published Date: 3rd Qtr. 2014	SDDOT	C. M. P. SAFETY ENDS	PLATE NUMBER 450.38
			Sheet 1 of 2



TYPE OF FENCE		LINE POST SPACING	BARBED WIRE		WOVEN WIRE
TYPE	DESCRIPTION		WIRE GAGE	NUMBER AND SHAPE OF BARBS	STYLE OR DESIGN NO.
1	3 Barbed Wires	16'-6"	12½	2 Point Round	—
2	4 Barbed Wires	16'-6"	12½	2 Point Round	—
3	5 Barbed Wires	16'-6"	12½	2 Point Round	—
4	26" Woven Wire with 2 Barbed Wires	14'-0"	12½	2 Point Round	726-6-12½
5	26" Woven Wire with 4 Barbed Wires	14'-0"	12½	2 wires with 2 Pt. Rd. 2 wires with 4 Pt. Rd.	726-6-12½
6	32" Woven Wire with 3 Barbed Wires	14'-0"	12½	2 wires with 2 Pt. Rd. 1 wire with 4 Pt. Rd.	832-6-12½

GENERAL NOTES:

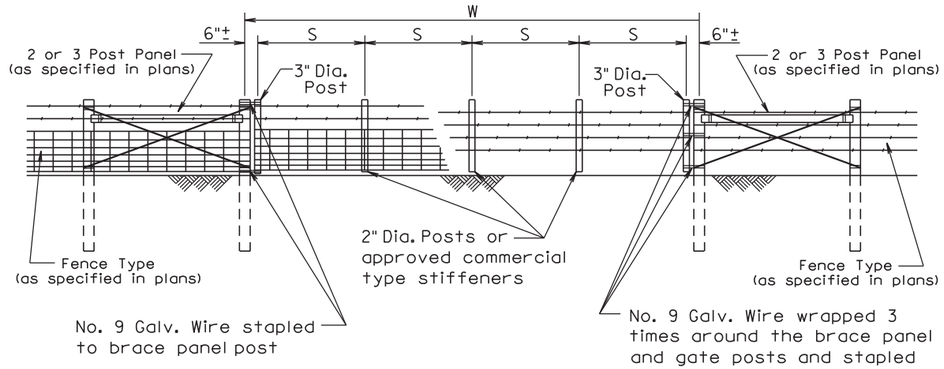
Fence types designated on the plans that are followed by the letter S shall have smooth (barbless) wires.

When type 5S or 6S is designated the bottom wire may be barbed, smooth, or left off.

All degrees of curvature stated for fence are at centerline of roadway.

September 14, 2009

Published Date: 3rd Qtr. 2014	SDDOT	*RIGHT-OF-WAY FENCE*	*PLATE NUMBER* 620.01 *Sheet 1 of 1*



W Gate Width (ft.)	S Post Spacing
16	3 @ 5'-0" ±
20	4 @ 4'-9" ±
24	4 @ 5'-9" ±
30	5 @ 5'-10" ±
40	6 @ 6'-6" ±

GENERAL NOTES:

Creosote treatment of the gate posts will not be accepted.

The type of fencing in the gate shall be of the same type as specified for the adjacent Right-of-Way fence.

All costs for furnishing and constructing the wire gate(s) shall be incidental to the contract unit price per Ft for the respective Right-of-Way fence bid item.

March 31, 2000

Published Date: 3rd Qtr. 2014	SDDOT	*WIRE GATES*	*PLATE NUMBER* 620.20 *Sheet 1 of 1*

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)	Taper Length (Feet) (L)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	100 - 200	180	25
35 - 40	350	320	25
45 - 50	500	600	50
55	750	660	50
60 - 65	1000	780	50

■ Channelizing Device

The channelizing devices shall be drums or 42" cones if traffic control must remain overnight or longer.

For short duration operations (1 hour or less) all signs and channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.

Worker signs (W21-1 or W21-1a) may be used instead of SHOULDER WORK signs.

A SHOULDER WORK sign should be placed on the left side of a divided or one-way roadway only if the left shoulder is affected.

The SHOULDER WORK sign on an intersecting roadway is not required if drivers emerging from that roadway will encounter another advance warning sign before they reach a work activity area.

February 14, 2011

Published Date: 3rd Qtr. 2014	SDDOT	**GUIDES FOR TRAFFIC CONTROL DEVICES WORK ON SHOULDERS**	*PLATE NUMBER* 634.03
			Sheet 1 of 1

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	200	25
35 - 40	350	25
45 - 50	500	50
55	750	50
60 - 65	1000	50

■ Flagger

■ Channelizing Device

For low-volume traffic situations with short work zones on straight roadways where the flagger is visible to road users approaching from both directions, a single flagger may be used.

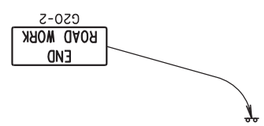
The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (1 hour or less).

For tack and/or flush seal operations, when flaggers are not being used, the FRESH OIL sign (W21-2) shall be displayed in advance of the liquid asphalt areas.

Flashing warning lights and/or flags may be used to call attention to the advance warning signs.

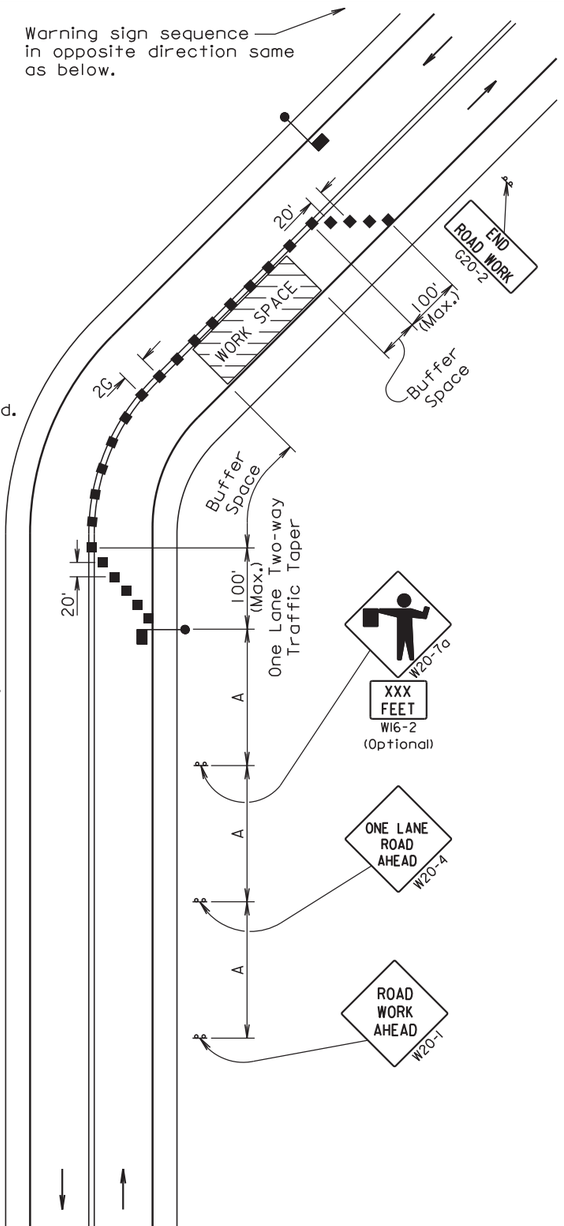
The channelizing devices shall be drums or 42" cones.

Channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.



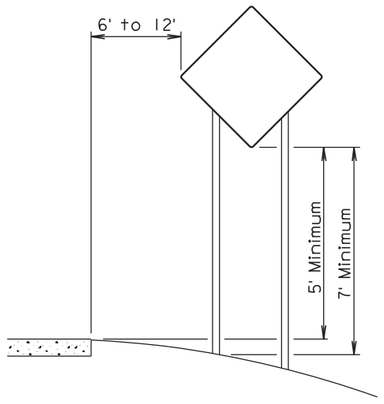
Channelizing devices and flaggers shall be used at intersecting roads to control intersecting road traffic as required.

The buffer space should be extended so that the two-way traffic taper is placed before a horizontal or vertical curve to provide adequate sight distance for the flagger and queue of stopped vehicles.

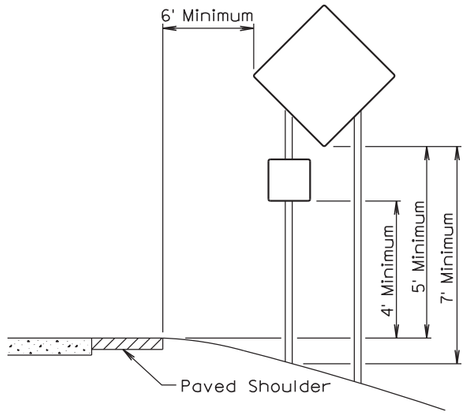


February 14, 2011

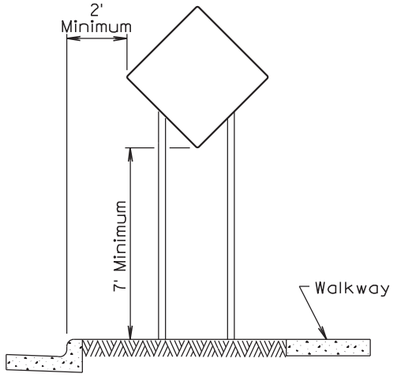
Published Date: 3rd Qtr. 2014	SDDOT	**GUIDES FOR TRAFFIC CONTROL DEVICES LANE CLOSURE WITH FLAGGER PROVIDED**	*PLATE NUMBER* 634.23
			Sheet 1 of 1



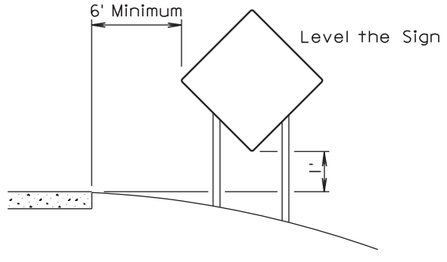
RURAL DISTRICT



RURAL DISTRICT WITH
SUPPLEMENTAL PLATE



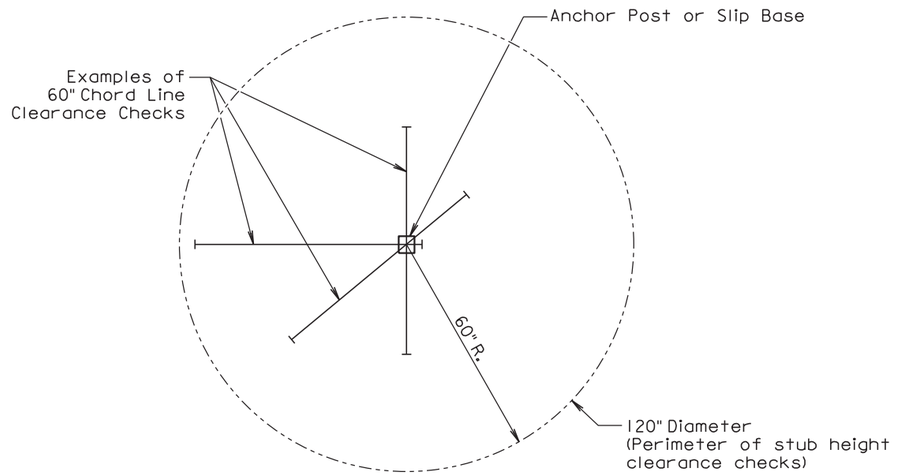
URBAN DISTRICT



RURAL DISTRICT
3 DAY MAXIMUM

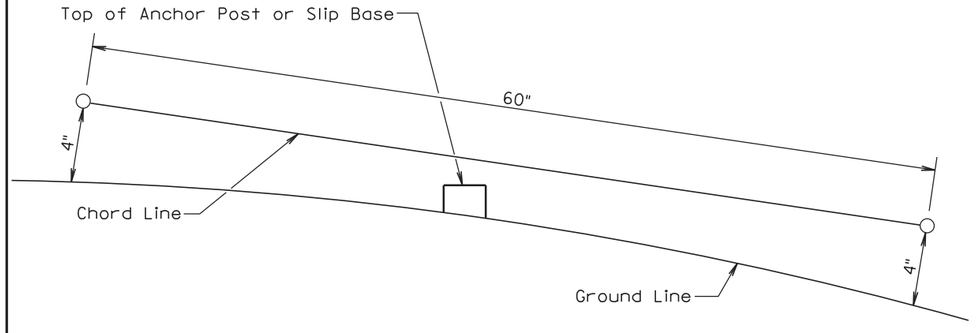
February 14, 2011

Published Date: 3rd Qtr. 2014	SDDOT	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85
			Sheet 1 of 1



PLAN VIEW

(Examples of stub height clearance checks)



ELEVATION VIEW

GENERAL NOTES:

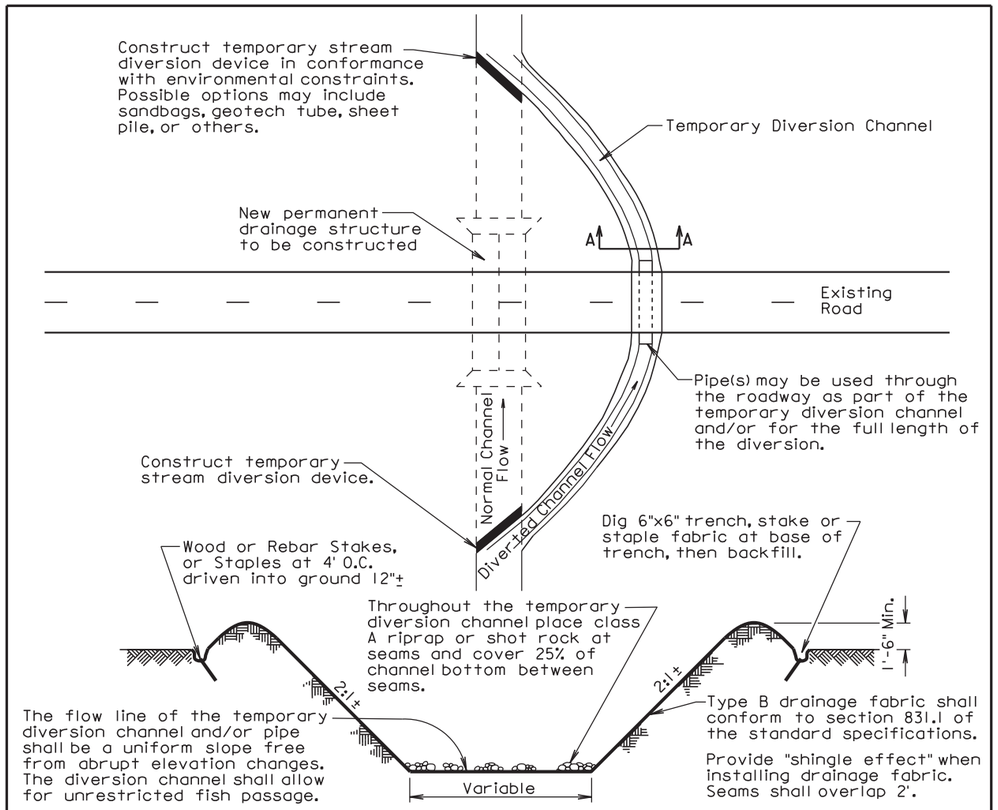
The top of anchor posts and slip bases SHALL NOT extend above a 60" chord line within a 120" diameter circle around the post with ends 4" above the ground.

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

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

July 1, 2005

Published Date: 3rd Qtr. 2014	SDDOT	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
			Sheet 1 of 1



SECTION A-A

TEMPORARY DIVERSION CHANNEL

GENERAL NOTES:

A temporary diversion channel and/or pipe(s) shall be used to divert stream or drainage away from a construction area to provide a dry work area for construction. The diversion of streams and waterways is intended to protect the streams and waterways from various construction contaminants and sediment. Disturbing the existing stream channel and riparian zone should be minimized. Equipment shall not cross through the stream outside of the work area.

Sizing of the temporary diversion channel and/or pipe(s) shall be the Contractor's responsibility.

The method and materials used to construct the stream diversion device shall be the Contractor's responsibility, however, earthen berms are not acceptable since their removal causes siltation problems.

The Contractor shall restore the original channel bottom to its original condition prior to returning any flows. Upon completion of the new permanent drainage structure, the temporary stream diversion block or device shall be removed in a manner that will not cause violation of water quality standards. The temporary diversion channel shall then be backfilled and any pipe(s) (if used) shall be removed. The entire work area shall be cleaned and restored to smooth/even contours.

All costs for labor, equipment, materials and incidentals as indicated on this sheet to complete a satisfactory Temporary Diversion Channel and/or Pipe(s) shall be incidental to the contract unit price per each for "Temporary Diversion Channel and/or Pipe(s)". "Temporary Diversion Channel and/or Pipe(s)" will be paid for once per structure site regardless or the number of times water is diverted at the individual site.

December 23, 2004

Published Date: 3rd Qtr. 2014	**SDDOT**	***TEMPORARY DIVERSION CHANNEL***	***PLATE NUMBER*** *734.30*
			Sheet 1 of 1