

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	PT 0014(238)203	1	65

Plotting Date: 5/7/2024

STATE OF SOUTH DAKOTA **FOR BIDDING PURPOSES ONLY**  
 DEPARTMENT OF TRANSPORTATION

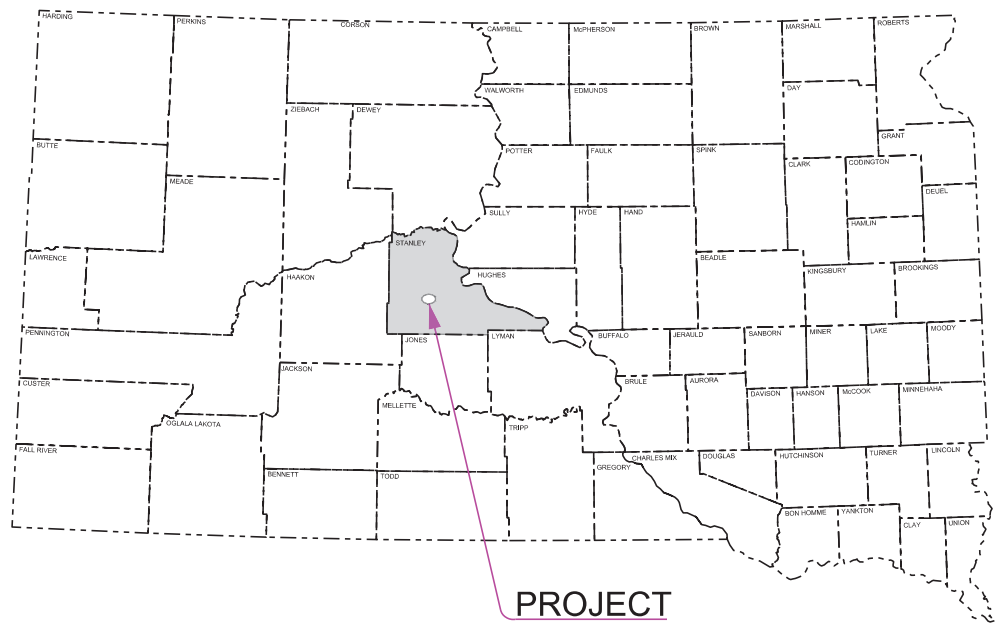
PLANS FOR PROPOSED  
**PROJECT PT 0014(238)203**  
**US HIGHWAY 14**  
**STANLEY COUNTY**

PIPE REPAIR, EROSION CONTROL, AND SLIDE REPAIR  
 PCN 06X7

INDEX OF SHEETS

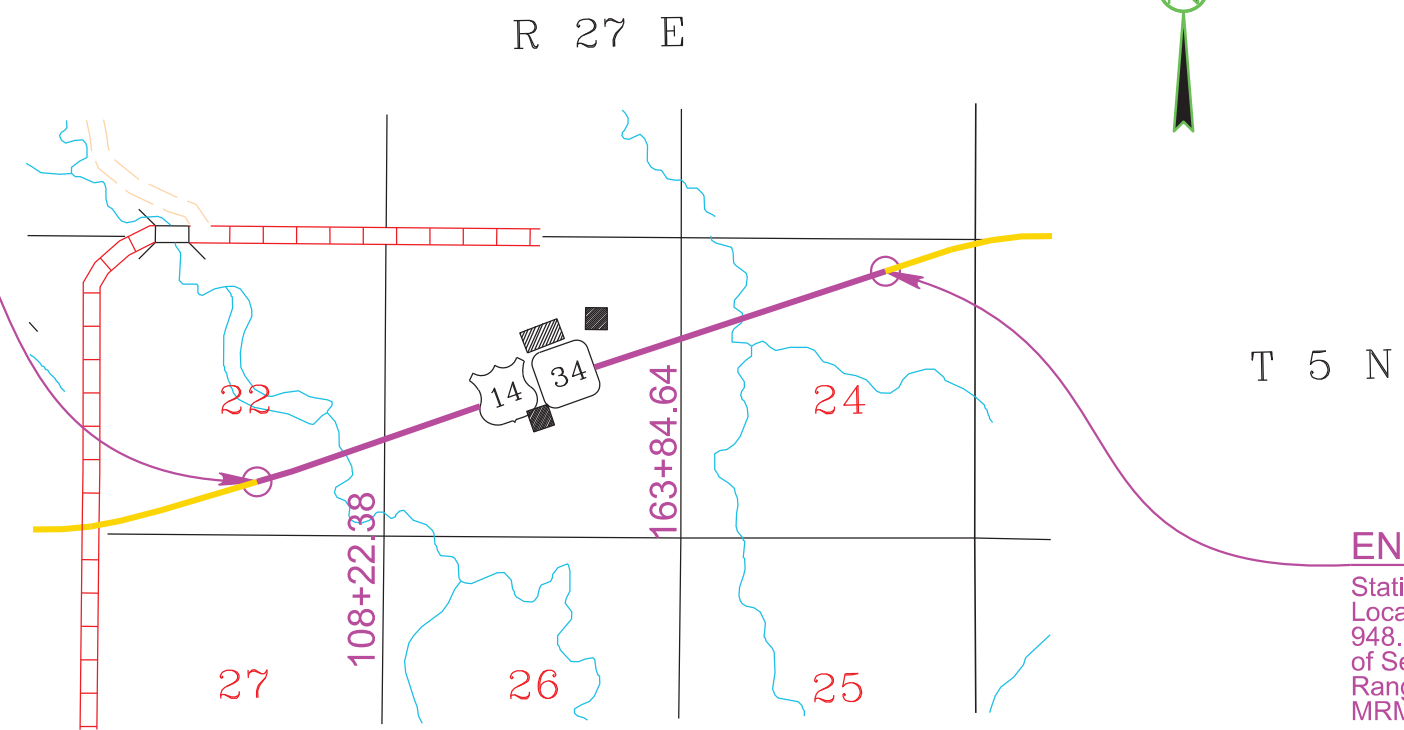
- Sheet 1: Layout Map & Index of Sheets
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Plot Scale - 1:200



**BEGIN PT 0014(238)203**

Station 82+77.77 on F 0014(38)202  
 Located 588.27 Feet North and  
 2556.59 feet West of the Southeast corner  
 of Section 22 - Township 5 North -  
 Range 27 East of the B.H.M.  
 MRM 203.40+0.540



**END PT 0014(238)203**

Station 211+28.69 on F 0014(38)202  
 Located 557.64 Feet South and  
 948.55 Feet West of the Northeast corner  
 of Section 24 - Township 5 North -  
 Range 27 East of the B.H.M.  
 MRM 206.00+0.374

**DESIGN DESIGNATION**

AADT (2022)	1330
AADT (2042)	1923
DHV	306
D	50%
DHV T%	8.7%
AADT T%	19.2%
V	65 mph

**STORM WATER PERMIT**

Major Receiving  
 Body of Water: Missouri  
 Area Disturbed: 4.9 Acres  
 Total Project Area: 8.0 Acres  
 Approx. Begin Lat, Long:  
 44°22'26.28" N  
 100°50'31.88" W

Gross Length	12852 Feet	2.434 Miles
Length of Exceptions	0 Feet	0 Miles
Net Length	12852 Feet	2.434 Miles



**9**

December 4, 2024

Plotted From - evanwolf

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Rev 5/22/24 pk

**ESTIMATE OF QUANTITIES**

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
110E0600	Remove Fence	3,100	Ft
110E1690	Remove Sediment	3.9	CuYd
110E1700	Remove Silt Fence	490	Ft
110E7500	Remove Pipe for Reset	16	Ft
110E7510	Remove Pipe End Section for Reset	2	Each
120E0600	Contractor Furnished Borrow	7,232	CuYd
120E4100	Reprofiling Ditch	0.5	Sta
230E0100	Remove and Replace Topsoil	Lump Sum	LS
250E0020	Incidental Work, Grading	Lump Sum	LS
450E0142	24" RCP Class 2, Furnish	20	Ft
450E0150	24" RCP, Install	20	Ft
450E0192	42" RCP Class 2, Furnish	8	Ft
450E0200	42" RCP, Install	8	Ft
450E4768	24" CMP 14 Gauge, Furnish	48	Ft
450E4770	24" CMP, Install	48	Ft
450E4778	30" CMP 14 Gauge, Furnish	352	Ft
450E4780	30" CMP, Install	352	Ft
450E4788	36" CMP 14 Gauge, Furnish	368	Ft
450E4790	36" CMP, Install	368	Ft
450E4798	42" CMP 14 Gauge, Furnish	40	Ft
450E4800	42" CMP, Install	40	Ft
450E5015	24" CMP Elbow, Furnish	2	Each
450E5016	24" CMP Elbow, Install	2	Each
450E5020	30" CMP Elbow, Furnish	4	Each
450E5021	30" CMP Elbow, Install	4	Each
450E5025	36" CMP Elbow, Furnish	5	Each
450E5026	36" CMP Elbow, Install	5	Each
450E5030	42" CMP Elbow, Furnish	2	Each
450E5031	42" CMP Elbow, Install	2	Each
450E5215	24" CMP Flared End, Furnish	1	Each
450E5216	24" CMP Flared End, Install	1	Each
450E5219	30" CMP Flared End, Furnish	6	Each
450E5220	30" CMP Flared End, Install	6	Each
450E5223	36" CMP Flared End, Furnish	5	Each
450E5224	36" CMP Flared End, Install	5	Each
450E5227	42" CMP Flared End, Furnish	1	Each
450E5228	42" CMP Flared End, Install	1	Each
450E7630	30" Steel Pipe, Furnish	290	Ft
450E8014	24" RCP to CMP Transition, Furnish	1	Each
450E8015	24" Pipe Transition, Install	1	Each
450E8029	42" RCP to CMP Transition, Furnish	1	Each
450E8030	42" Pipe Transition, Install	1	Each

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
450E8300	Culvert Joint Cleaning	204.0	Ft
450E8305	Repair Culvert Joint	204.0	Ft
450E8310	Chemical Grout Void Fill	10.0	Gal
450E9000	Reset Pipe	16	Ft
450E9001	Reset Pipe End Section	2	Each
451E5130	Bore and Jack 30" Pipe	290	Ft
462E0250	Cellular Grout	48.2	CuYd
600E0200	Type II Field Laboratory	1	Each
620E0020	Type 2 Right-of-Way Fence	3,100	Ft
620E0515	Type 1A Temporary Fence	4,817	Ft
620E1020	2 Post Panel	22	Each
620E1030	3 Post Panel	2	Each
632E2510	Type 2 Object Marker Back to Back	4	Each
634E0010	Flagging	40.0	Hour
634E0110	Traffic Control Signs	242.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
700E0210	Class B Riprap	1,539.2	Ton
730E1200	Hydroseeding	15,342	SqYd
732E0200	Fiber Mulching	4.9	Ton
734E0103	Type 3 Erosion Control Blanket	14,436	SqYd
734E0132	Type 2 Turf Reinforcement Mat	228.0	SqYd
734E0154	12" Diameter Erosion Control Wattle	1,728	Ft
734E0165	Remove and Reset Erosion Control Wattle	441	Ft
734E0400	Rock Check Dam	110.3	CuYd
734E0510	Shaping for Erosion Control Blanket	1,250	Ft
734E0604	High Flow Silt Fence	1,960	Ft
734E0610	Mucking Silt Fence	136	CuYd
734E0620	Repair Silt Fence	490	Ft
831E0110	Type B Drainage Fabric	1,730	SqYd

**SPECIFICATIONS**

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



**ENVIRONMENTAL COMMITMENTS**

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

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

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

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

**COMMITMENT A: WETLANDS**

All efforts to avoid and minimize wetland impacts from the project have resulted in approximately 0.01 acre(s) of wetlands (includes temporary and permanent) becoming impacted. Refer to the plan sheets for location and boundaries of the impacted wetlands.

**Table of Impacted Wetlands**

Wetland No.	Station	Perm. Impact Left (Acres)	Perm. Impact Right (Acres)	Temp. Impact Left (Acres)	Temp. Impact Right (Acres)	Total Impact (Acres)
1	174+75	0.001	0.00	0.009	0.00	0.01

**Action Taken/Required:**

Mitigation is required in accordance with the "Statewide Finding Regarding Wetlands for South Dakota Federal-Aid Highway Projects (February 2018)". Replacement of 0.001 acre(s) of permanent wetland impacts will be completed through another wetland mitigation opportunity in a manner which considers FHWA's program-wide goal of 'net gain' of wetlands through enhancement, creation, and preservation.

Temporary impacts identified in the Table of Impacted Wetlands will not be mitigated as original contours and elevations will be re-established as designated in the plan sheets. Prior to initiating temporary work in wetlands, the Contractor will submit a plan to the Project Engineer in accordance with Section 7.21 D of the SDDOT Standard Specifications for Roads and Bridges.

The Contractor will notify the Project Engineer if additional easement is needed to complete work adjacent to any wetland. The Project Engineer will obtain an appropriate course of action from the Environmental Office before proceeding with construction activities that affect any wetlands beyond the work limits and easements shown in the plans.

**COMMITMENT B: FEDERALLY THREATENED, ENDANGERED, AND PROTECTED SPECIES**

**COMMITMENT B2: WHOOPING CRANE**

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

**Action Taken/Required:**

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

**COMMITMENT C: WATER SOURCE**

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

**Action Taken/Required:**

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

Additional information and mapping of water sources impacted by Aquatic Invasive Species in South Dakota can be accessed at:

< <http://sdleastwanted.com/maps/default.aspx> >

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

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**COMMITMENT D: WATER QUALITY STANDARDS**

**COMMITMENT D1: SURFACE WATER QUALITY**

This project may be in the vicinity of multiple streams and wetlands. These waters are considered waters of the state and are protected under Administrative Rules of South Dakota (ARSD) Chapter 74:51. Special construction measures may have to be taken to ensure that this water body is not impacted.

**Action Taken/Required:**

The Contractor is advised that the South Dakota Surface Water Quality Standards, administered by the South Dakota Department of Environment and Natural Resources (DENR), apply to this project. Special construction measures will be taken to ensure the above standard(s) of the surface waters are maintained and protected.

**COMMITMENT D2: SURFACE WATER DISCHARGE**

The DENR General Permit for Temporary Discharge is required for temporary dewatering and discharges to waters of the state. The effluent limit for total suspended solids will be 90 mg/L 30-day average. The effluent limit applies to discharges to all waters of the state except discharges to waters classified as cold water permanent fish life propagation waters according to the ARSD 74:51:01:45. For discharges to waters of the state classified as cold water permanent fish life propagation waters, the effluent limit for total suspended solids will be 53 mg/L daily maximum.

The permittee has the option of completing effluent testing or implementing a pollution prevention plan for compliance with this permit. If the permittee develops a pollution prevention plan instead of total suspended solids sampling, the plan must be developed and implemented prior to discontinuing total suspended solids sampling. Refer to Section 4.0 of the permit. If any pollutants are suspected of being discharged, a sample must be taken for those parameters listed in Section 3.4 of the permit.

Refer to Commitment D1: Surface Water Quality for stream classification.

**Action Taken/Required:**

If construction dewatering is required and this project is not required to be covered under a General Permit for Stormwater Discharges Associated with Construction Activities, the Contractor will obtain the General Permit for Temporary Discharge Activities from the DENR Surface Water Program, 605-773-3351.

< <http://denr.sd.gov/des/sw/swqformsandpermits.aspx> >



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**COMMITMENT E: STORM WATER**

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.

Construction activities constitute 1 acre or more of earth disturbance and/or work in a waterway.

**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.

Construction activities constitute 1 acre or more of earth disturbance and/or work in a waterway.

**Action Taken/Required:**

The DANR General Permit for Stormwater Discharges Associated with Construction Activities is required for construction activity disturbing one or more acres of earth and work in a waterway. The SDDOT is the owner of this permit and will submit the NOI to DANR 15 days prior to project start in order to obtain coverage under the General Permit. Work can begin once the DANR letter of approval is received.

The Contractor must adhere to the "Special Provision Regarding Storm Water Discharges to Waters of the State."

The Contractor will complete the DANR Contractor Certification Form prior to the pre-construction meeting. The form certifies under penalty of law that the Contractor understands and will comply with the terms and conditions of the permit for this project. Work may not begin on this project until this form is signed and submitted to DANR.

The form can be found at: [https://danr.sd.gov/OfficeOfWater/SurfaceWaterQuality/docs/DANR\\_CGP\\_AppendixCCA2018Fillable.pdf](https://danr.sd.gov/OfficeOfWater/SurfaceWaterQuality/docs/DANR_CGP_AppendixCCA2018Fillable.pdf)

The Contractor is advised that permit coverage may also be required for off-site activities, such as borrow and staging areas, which are the responsibility of the Contractor.

The Contractor is advised that permit coverage may also be required for off-site activities, such as borrow and staging areas, which are the responsibility of the Contractor.

**Storm Water Pollution Prevention Plan**

The Storm Water Pollution Prevention Plan (SWPPP) will be developed prior to the submittal of the NOI and will be implemented for all construction activities for compliance with the permit. The SWPPP must be kept on-site and updated as site conditions change. Erosion control measures and best management practices will be implemented in accordance with the SWPPP.

The DOT 298 Form will be used for site inspections and to document changes to the SWPPP. A copy of the completed inspection form will be filed with the SWPPP documents and retained for a minimum of three years.

The inspection will include disturbed areas of the construction site that have not been finally stabilized, areas used for storage materials, structural control

measures, and locations where vehicles enter or exit the site. These areas will be inspected for evidence of, or the potential for, pollutants entering the drainage system. Erosion and sediment control measures identified in the SWPPP will be observed to ensure that they are operating correctly, and sediment is not tracked off the site.

Information on storm water permits and SWPPPs are available on the following websites:

SDDOT: < <https://dot.sd.gov/doing-business/environmental/stormwater> >

DANR:<<https://danr.sd.gov/OfficeOfWater/SurfaceWaterQuality/stormwater/default.aspx>>

EPA: < <https://www.epa.gov/npdes> >

**COMMITMENT H: WASTE DISPOSAL SITE**

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

**Action Taken/Required:**

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

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

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

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

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

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

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

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

**COMMITMENT I: HISTORIC PRESERVATION OFFICE CLEARANCES**

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

**Action Taken/Required:**

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

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

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

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



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**COMMITMENT I: HISTORIC PRESERVATION OFFICE CLEARANCES**  
**(Continued)**

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

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

**COMMITMENT N: SECTION 404 PERMIT**

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

**Action Taken/Required:**

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

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



**SEQUENCE OF OPERATIONS**

The Contractor will submit a sequence of operations for approval two weeks prior to the preconstruction meeting. If changes to the sequence of operations are proposed during the project, these must be submitted for review a minimum of one week prior to potential implementation. Approval for changes to the 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.

**UTILITIES**

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

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

**TYPE II FIELD LABORATORY**

The lab will be equipped with an internet connection such as DSL, cable modem, or other approved service. The internet connection will be provided with a multi-port wireless router. The internet connection will be a minimum speed of 5 Mbps unless limited by job location and approved by the DOT. Prior to installing the wireless router, the Contractor will submit the wireless router's technical data to the Area Office to check for compatibility with the state's computer equipment. The internet connection is intended for state personnel usage only. The Contractor's personnel are prohibited from using the internet connection unless pre-approved by the Project Engineer. These items will be incidental to the contract unit price per each for "Type II Field Laboratory".

**GENERAL TRAFFIC CONTROL**

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

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

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

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

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

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

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

All haul trucks will be equipped with an additional flashing amber light that is visible from the backside of the haul truck. The costs for the flashing amber lights will be incidental to the various related contract items.

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

**INSLOPE TRANSITIONS**

Inslope transitions will be required at various pipe locations. Refer to Standard Plate 120.05 for details.

**GERNEAL GEOLOGY**

The project alignment traverses the Pierre Shale and localized areas of Quaternary Alluvium Deposits. The South Dakota Geologic Survey describes the deposits/formations that will be encountered on the project as outlined below:

Quaternary Alluvium deposits consist of clay to boulder sized clasts with locally abundant organic material. Alluvial material may be encountered within the Medicine Creek floodplain.

The Pierre Shale consists of blue gray to dark gray, fissile to blocky shale with persistent beds of bentonite, black organic shale, and light-brown chalky shale. Contains minor sandstone, conglomerate, and abundant carbonate and ferruginous concretions.

**CLASSIFICATION OF EXCAVATION**

Most of the material encountered should be able to be excavated using conventional methods associated with normal Unclassified Excavation.

**CONTRACTOR FURNISHED BORROW**

The Contractor will 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 will be approved by the Engineer. The plans quantity for "Contractor Furnished Borrow" as shown in the Estimate of Quantities will be the basis of payment for this item.

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

**INCIDENTAL WORK, GRADING**

Station	L/R	Remarks
84+66 to 85+84	R	Remove 147' of Existing 24" CMP and 2 End Sections
86+62	Both	Remove 2 Flared Ends
145+56	R	Adjust Fence Panels for access to Cattle Pass
154+50 ±		Locate Buried Pipe
170+75 to 172+27	L	Remove 155' of Existing 36" CMP and 2 End Sections
187+13	R	Remove 16' of Existing 24" RCP and 1 End Section
202+24	R	Remove 44' of Existing Culvert
210+19 to 210+24	R	Remove 15' of Existing 36" RCP and 1 End Section
210+24 to 210+69	R	Remove 52' of Existing 30" RCP and 2 End Sections

Contractor will attempt to locate a buried pipe at station 154+50+. If found, the culvert will be plugged, as determined by the Engineer. Any work completed at this site will utilize existing contract items. Quantities required for plugging the culvert at this location will be added to the contract by CCO.



**CELLULAR GROUT**

Cellular Grout will be used to plug the existing pipe at Station 86+62.

The Contractor will submit a proposed grouting procedure to the Engineer at least two weeks prior to beginning this work.

Bulkheads will be constructed at each end of the pipe. Each bulkhead will be constructed to withstand the pressure of the grouting operation. The bulkhead will extend from the end of the existing pipe inward a minimum depth of 18 inches and will be free from leaks.

Pressure grouting will be done to ensure all the voids are filled including all breaks or holes in and around the existing pipe.

The grout will be a cellular grout (grout with pre-generated foam) with a minimum 28-day compressive strength of 100 pounds per square inch. If water is not present within the pipe a low-density grout with a minimum of 30 pounds per cubic foot wet density may be used. When it is not possible to dewater the existing pipe, a high-density grout with a minimum of 70 pounds per cubic foot will be used which may include approved sand. The foaming agent used will meet the requirements of ASTM C869 when tested in accordance with ASTM C796.

Both of the cellular grout mix designs will be submitted to the SDDOT Concrete Engineer for approval prior to use. The mix design submittal will include the base cement slurry mix per cubic yard, expansion factor from the foaming agent, and the cellular grout wet density (pounds per cubic foot).

The Contractor will install a bypass valve adjacent to the location where the pressure grouting hose is attached for obtaining samples to be checked for wet density. The wet density of the cellular grout will be checked by the

Contractor to verify the proper minimum wet density before the cellular grout filling operations begin and at a minimum once every two hours during production. The SDDOT will document the results of the density checks.

Cellular grout will be wasted until the cellular grout meets the minimum wet density required; however, if 0.5 cubic yards or more of base cement slurry is wasted trying to meet density requirements, then that quantity will not be included for payment.

If grout holes are utilized, cylindrical wooden plugs or other approved plugs will be inserted to plug holes until the grout has set. After the plugs are removed the holes will be filled with concrete.

The quantity of cellular grout was estimated based on volume of the existing pipe and voids outside the existing pipe.

The quantity of base cement slurry ordered will be approved by the Engineer. The quantity of base cement slurry needed will be calculated to the nearest tenth of a cubic yard using the approved mix design, expansion factor of the foaming agent, and estimated amount of cellular grout. The quantity for payment to the nearest tenth of a cubic yard of "Cellular Grout" is a calculated quantity based on the amount of base cement slurry used on the project to the nearest tenth of a cubic yard, expansion factor of the foaming agent, and approved mix design.

All costs for furnishing and installing the cellular grout including bulkhead construction, inlet bevel construction, and incidentals necessary to satisfactorily complete the work will be included in the contract unit price per cubic yard for "Cellular Grout".

**BORE AND JACK STEEL PIPE**

The Contractor will install steel pipe at station 86+74 by boring and jacking the pipe through the existing highway embankment. The pipe will be installed by boring and jacking methods as specified herein unless an alternate plan is submitted in writing and approved by the Engineer.

As shown on the appropriate pipe cross section, some excavation of the existing roadway embankment is anticipated in order to reduce the length of the bore and jack pipe installation.

Steel pipe for boring and jacking will meet or exceed the requirements of ASTM A53 Grade B, ASTM A139 Grade B or ASTM A252 Grade 2. Hydrostatic testing will not be required for this application. The pipe will be required to have the minimum wall thickness as shown in the following table:

Pipe Diameter	Wall Thickness
48" & below	1/2"
54"	5/8"
60"	5/8"
66"	3/4"
72"	3/4"

The exterior of the steel pipe will be coated with a fusion bonded epoxy coating and an abrasion resistant overcoat or a two-component coal tar epoxy. The coal tar will meet the requirements of Sherwin-Williams Targuard, Tnemec Hi-Build Tneme-Tar, or an approved equal. Applications of the coatings will be in conformance with the manufacturer's recommendations.

The pipe joints will be welded by a certified welder in accordance with Section 410.3 D of the Specifications. After the welding has been completed, the exposed area will be coated with 3M Scotchkote Liquid Epoxy 328 or a two-component coal tar epoxy meeting the requirements of Sherwin-Williams Targuard, Tnemec Hi-Build Tneme-Tar, or an approved equal.

The jacking pit will be constructed of sufficient size to accommodate equipment and workmen. The pit walls will be sloped or shored to comply with all applicable State and Federal regulations. The Contractor will be responsible for the design of the pit floor and jacking thrust restraint wall to carry the cyclic loads and thrust applied by the Contractor's operation. Water will not be allowed to accumulate in the jacking pit. All components of the jacking pit will be removed after installation of the pipe unless otherwise allowed by the Engineer.

The pipe will be pushed into position from a jacking pit with hydraulic jacks while simultaneously excavating at the forward end of the pipe. Each pipe section will be jacked from the jacking pit as the excavation at the boring head progresses so that the excavation is supported by the boring head or the pipe at all points.

Jacking thrust will be applied to the pipe by means of a yoke or frame designed to distribute the thrust uniformly around the pipe joint. The thrust will be applied to the pipe joint only in the location and only to the maximum force recommended by the pipe manufacturer. The pipe will be jacked into place without visible damage to the pipe or joint.

**FOR BIDDING PURPOSES ONLY**

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The boring head excavation will be circular with a maximum diameter equal to the outside diameter of the jacking pipe plus 1 inch. The Contractor will take whatever corrective action is necessary to prevent running, flowing, or squeezing ground conditions at the cutting face from causing large voids or significant loss of soil that may cause surface settlement.

The Contractor will control the alignment and grade of the pipe installation to meet the following tolerances:

1. Maximum horizontal deviation from plan shown alignment will be less than 0.15% of pipe length from the downstream end of pipe to the point of measurement.
2. Maximum vertical deviation from plan shown alignment will be less than 0.075% of pipe length from the downstream end of pipe to the point of measurement.

All material excavated by the boring head for the pipe installation will be disposed of by the Contractor. The excavated material from the boring pit will be used as backfill for the pit and compacted into place to the satisfaction of the Engineer.

Steel casing will be installed horizontally through approximately 270 feet of embankment. The pipe will be placed through an approximate 15' to 40' vertical depth of silt clay embankment fill material. The parent formations from which the embankment materials were excavated include beds of shale, claystone, and minor sandstone with carbonate and ferruginous concretions. Large boulders are not anticipated to be encountered within the bore and jack envelope.

Installation of CMP ends on the steel pipe will require the placement of a minimum of 2 welded stops at each pipe end to prevent the end from slipping off the steel pipe. The location and size will be determined in the field by the Engineer and installed by a certified welder. Stops will be coated with a coal tar epoxy. All costs, including labor and materials for the installation of the stops will be incidental to the contract unit price per foot for the corresponding steel pipe furnish contract item. Alternative methods of attachment may be allowed with the approval of the Engineer.

Payment for furnishing the pipe will be incidental to the contract unit price per foot for the corresponding steel pipe furnish contract item.

All costs involved with boring and jacking the pipe including labor, equipment, welding, materials, disposal of waste material, constructing and backfilling the jacking pit, and excavating and backfilling the roadway embankment will be incidental to the contract unit price per foot for the corresponding bore and jack pipe contract item.



**CONSTRUCTION DOCUMENTS**

Electronic grading files or documents are not available for this project. The Contractor will install the culverts and erosion control appurtenances, as per the contract plan documents. Any modifications, due to changing field conditions, must be approved by the Engineer.

**PIPE FOR DOWNSPOUTS**

The substitution of Class 2 reinforced concrete pipe, high density polyethylene pipe, polypropylene pipe, or steel reinforced polyethylene pipe for corrugated metal downspout pipes is not allowed.

**CORRUGATED METAL PIPE**

Corrugated metal pipes will have 2 3/8-inch x 1/2-inch corrugations for 42-inch and smaller round pipe and 48-inch and smaller arch pipe unless otherwise stated in the plans. Corrugated metal pipes will have 3-inch x 1-inch or 5-inch x 1-inch corrugations for 48-inch and larger round pipe and 54-inch and larger arch pipe unless otherwise stated in the plans.

The gauge of the corrugated metal elbows, and ends will match the thickest gauge of corrugated metal pipe it is connected to.

Areas within the project have soils that are highly corrosive to steel. Corrugated metal pipe in these areas will be polymer coated 14 gauge steel as specified in the Table of Pipe Quantities. Any required connection bands, elbows, tees, crosses, wyes, reducers, and transitions will also be polymer coated. The connection bands will be 24 inches wide. All polymer coated corrugated metal pipe and components will be in conformance with AASHTO M245. Riveted pipe will not be allowed.

All damage to the polymer coating will be repaired in accordance with the manufacturer's recommendations prior to installation of the pipe.

All costs associated with the polymer coating including repair of polymer coating will be incidental to the corresponding CMP contract items.

Metal pipe end sections connected to polymer coated CMP will be aluminum-coated (Type 2) in accordance with AASHTO M36 as specified in the Table of Pipe Quantities. All costs associated for gauge, coating, and connections will be incidental to the corresponding CMP End Section contract items

**REMOVE AND REPLACE TOPSOIL**

Topsoil will also be salvaged and stockpiled prior to constructing the culvert extension/resets. Limits of this work, depth of salvage, and stockpile location will be directed by the Engineer. Following completion of construction, topsoil will be spread evenly over the disturbed areas. It is estimated that 3" of topsoil is available to be removed and replaced.

The estimated amount of topsoil to be removed and replaced is 1278 CuYd.

All costs associated with removing and replacing the topsoil will be incidental to the contract lump sum price for "Remove and Replace Topsoil".

**REINFORCED CONCRETE PIPE JOINT REPAIR AND VOID GROUTING FOR BIDDING PURPOSES ONLY**

The Contractor will provide a notarized statement, from the Manufacturer, that the products used for culvert joint repair meet the specified requirements, along with the Manufacturer's current product specification and installation instructions.

The Contractor will be an Approved Contractor of the Manufacturer of the specified product and will provide written certification from the Manufacturer attesting to their Approved Contractor status.

All product documentation and Contractor submittals must be submitted to the Engineer prior to or at the preconstruction conference. The Contractor must have the Engineer's approval prior to commencing any of this work.

The Contractor will follow the Manufacturer's installation instructions and specifications throughout the repair process

Temperature of the specified products is critical from the point of pumping to the point of injection. All polyurethanes react faster at higher temperatures. Drum heaters and heated hoses are required when ambient or ground temperatures are below 70 degrees Fahrenheit. The optimum hose temperature will vary with the weather conditions and the particular job site conditions with the minimum hose temperature being 75 degrees Fahrenheit and the maximum hose temperature being 95 degrees Fahrenheit and the drum temperature not to exceed 90 degrees Fahrenheit.

The Contractor will provide worker and inspector safety protective gear in accordance with the manufacturer, including but not limited to chemical goggles, face shields, eye wash system and NBR gloves.

The Contractor will provide safe storage and handling of materials prior to delivery and at the project site. All material installation, handling and storage will be in accordance with the Manufacturer's recommendations.

The Contractor will visit the project to determine the extent of culvert joints to be cleaned and filled, prior to bidding.

Culvert Joint Cleaning and Repair Culvert Joint quantities will be based upon the following table showing circumference of joints based upon culvert size and shape.

Pipe Diameter (In)	Round Pipe Circumference per Joint (Ft)	Arch Pipe Circumference per Joint (Ft)
36	9.4	
42	11.0	11.0
48	12.6	
54	14.1	
60	15.7	
66	17.3	
72	18.8	19.0
78	20.4	
84	22.0	

**CULVERT JOINT CLEANING**

This work will consist of cleaning of the culvert joints, washing the entire culvert and joints with a high-pressure washer, and if needed, wire brush cleaning of each joint to be repaired as directed by the Engineer. The entire culvert will be clean and dry and most notably the specified joints will be thoroughly cleaned to the satisfaction of the Engineer using a power washer with water pressure of at least 2500 psi. The culvert must be in a clean condition so that no deleterious material is trapped in the joints that are being repaired. The Contractor will dispose of all debris removed from the culverts during the cleaning operation as approved by the Engineer.

All costs for equipment, material and labor for the culvert joint cleaning work will be incidental to the contract unit price per foot for Culvert Joint Cleaning. Culvert Pipe Cleaning will be measured to the nearest 0.1 foot of joint which is cleaned for joint repair.

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	PT 0014(238)203	8	65





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**REPAIR CULVERT JOINT**

The culvert joints will be repaired in accordance with the Chemical Grout Manufacturer's directions to prevent future infiltration/exfiltration of soils and water and to keep the chemical grout from expanding back into the structure during injection.

The culvert joint will be repaired with a sealant comprised of water reactive hydrophilic polyurethane resin and dry oil free oakum. All grout will be injected under such pressure so as not to damage the existing drainage structure or roadway structure.

The Contractor will submit to the Engineer for approval a detailed procedure for the installation of the polyurethane grout.

The work will include, but is not limited to sealing each pipe joint with a hydrophilic polyurethane grout meeting the following specifications:

GEL FOAM II (Saturated Oakum Rope Joint Packing) as manufactured by Green Mountain International, LLC or equal.

ULTRA (Single Component Grout for Joint Injection) as manufactured by Green Mountain International, LLC or equal.

Excess grout and oakum will be trimmed from the interior face of the joint prior to applying the UV Protection (Gel Coat). The epoxy gel coat compound will be as recommended by the Manufacturer for both surface sealing and protecting the hydrophilic grout from UV exposure. The epoxy gel compound will be mixed and handled in accordance with the Manufacturer's recommendations and will meet the following requirements:

Epoxy gel sealant compounds manufactured by Green Mountain Grouts, LLC or equal.

All costs for all equipment, material and labor required to complete the work will be incidental to the contract unit price per foot for Repair Culvert Joint. Completion of the work includes initial saturated oakum rope packing of each joint, follow up injection of grout into the back side of each joint, trimming the excess grout and oakum from the interior face of the joint, application of the epoxy gel coat and site clean-up. Payment will be made per 0.1 foot of culvert joint repaired.

**DUAL COMPONENT CHEMICAL GROUT FOR VOID FILLING**

The external voids surrounding the culvert will be filled with an injected high expansion chemical grout compound. Holes will be strategically drilled as required and grout injected throughout the structure to effectively fill all voids that have developed outside of the structure due to the infiltration of external soils and materials into the culvert and "piping" (water running outside and under the structure due to separated joints). It is the Contractor's responsibility to locate reinforcing bars and conduit prior to drilling any grout holes. All grout will be injected under such pressure so as not to damage the existing drainage structure or roadway structure. All joints will be appropriately cleaned and sealed, with appropriate recommended cure time, prior to the injection of the void grouting. After completion of the void filling, all holes will be properly sealed.

The typical method consists of placing a layer of chemical grout behind or around the structure. The Contractor will submit for approval by the Engineer a detailed grouting plan showing the spacing, orientation and depth of the grout holes, as well as type of polyurethane grout to be used, range of gel times, equipment, mixing procedures, recommended injection pressure, technique for monitoring grout travel and any other pertinent information. The grouting plan should address the prevention of overfilling and prevention of damage to structures or roadway. The Contractor will submit this detailed procedure for the installation of the expansion grout to the Engineer for approval. The holes are drilled with a rotary percussion hammer drill using a sharp masonry bit with a minimum diameter of 3/8 inch to a maximum diameter of 5/8 inch. Care must be taken to prevent holes from causing damage to reinforcing bars or utility conduits. Drilled holes should be vacuumed and flushed. Use injection grout and methods as recommended by Manufacturer.

Injection can be monitored by either applicator's visual inspection or by pumping a specific amount of injection grout into each hole. The work will start at the inlet end of the pipe and proceed downstream to the outlet. Inject bottom row every other hole. When material appears at the adjacent port, discontinue injection at entry port and begin injection at the adjacent port. Continue injection process section by section from bottom of pipe to top of pipe in a continuous manner to next pipe section. Injection pressure will vary from 200 psi to 3000 psi depending on the width of the joint, thickness of the structure, and condition of the concrete.

The Contractor must supply the Engineer with three (3) prior job references of projects where they have successfully injected urethane resin for subgrade void filling applications, or soil stabilization.

**DUAL COMPONENT CHEMICAL GROUT FOR VOID FILLING**

- In lieu of three (3) prior job references the Contractor will:
- a) Obtain hands on training from the supplier on the installation procedures, and
  - b) Have the supplier on site to provide training to Contractor's staff. Supplier will be present for at least two complete pipe culvert repairs and until the Engineer is satisfied that Contractor's staff is competent in performing this work.

The chemical grout will be a dual component hydrophobic polyurethane grout compound which is non-flammable and non-toxic when cured.

The chemical grout mixture will have expansion properties listed in the data sheets of greater than eighteen (18) times its original volume and cure to rigid closed cell polyurethane foam. The grout will expand to fill any voids and must bond to the exterior surface of the structure. The chemical grout will be Mountain Grout U 4.0 dual component polyurethane grouts as manufactured by Green Mountain International LLC or equal.

All costs for equipment, material, and labor required to fill external voids surrounding the culvert will be incidental to the contract unit price per gallon for Chemical Grout Void Fill. Any overfilling of voids that results in damage to overlying pavement, highway user ride quality, or drainage structure integrity will be corrected and paid for by the Contractor. All corrections will be approved by the Engineer. Payment will be to the 0.1 gallon of chemical grout used, prior to expansion of the material.

A calibrated metering device will be used to measure the chemical grout and to assure proper mixing ratio of components.

After the grout cures, excess material will be removed flush with the pipe interior wall and the pipe left clean.

**OBJECT MARKERS**

New Type 2 Object Markers and posts will be furnished and installed according to the details of Standard Plates 632.01, 632.03, and 632.04 by the Contractor at the locations shown in the Table for Mainline Culvert Work. Cost for new Type 2 Object Markers and post installation is included in the contract unit price per each for Type 2 Object Marker, Back to Back.

**REMOVE & RESET PIPE**

The Contractor will tie each section of pipe to the adjacent sections with tie bolts conforming to Standard Plate 450.18. All costs for drilling holes, furnishing, and installing the tie bolt assembly will be incidental to the corresponding pipe bid item.

Existing tie bolts, if any, may be salvaged and reused if condition is acceptable to the Engineer.



**TEMPORARY FENCE**

The Contractor will verify the location of the temporary fence with the landowner prior to installation of the fence.

**TABLE OF FENCE QUANTITIES**

Station to Station	Remove Fence (Ft)	Type 2 Right-of-Way Fence (Ft)	Type 1A Temporary Fence (Ft)	2 Post Panels (Each)	3 Post Panels (Each)
82+78-76' R 89+17-77' R	640	640	871	2	
104+96-76' R 107+14-76' R	218	218	415	2	
114+38-77' R 115+76-76' R	138	138	441	2	
114+38-215' R 115+76-215' R	138	138		2	
148+63-76' R 155+98-150' R	748	748	1104	4	
170+62-82' L 170+93-76' L	35	35		2	
171+17-76' L 177+35-77' L	647	647	878	2	2
186+38-76' R 187+88-76' R	150	150	363	2	
200+92-77' R 202+87-77' R	195	195	460	2	
209+38-76' R 211+29-76' R	191	191	285	2	
<b>TOTALS:</b>	3100	3100	4817	22	2

**PERMANENT SEEDING**

The areas to be hydroseeded consist of all newly graded areas within the project limits except for the top of roadways, and temporary easements under cultivation. Permanent seeding will be incidental to the contract unit price per square yard for "Hydroseeding".

Lawn and turf seed, such as the Type F Permanent Seed Mixture, will be tested within 12 months prior to planting, exclusive of the calendar month in which the test was completed.

Type F Permanent Seed Mixture will consist of the following:

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

**MYCORRHIZAL INOCULUM**

Mycorrhizal inoculum will 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 will provide certification of the fungal species claimed and the live propagule count. The inoculum will

include a minimum 25% the fungal species *Rhizophagus intraradices*. The remaining 75% may include other endomycorrhizal fungal species.

All seed will be inoculated by the seed supplier with a minimum of 100,000 live propagules of mycorrhizal fungi per acre. All costs of inoculating the seed will be incidental to the contract unit price per square yard for Hydroseeding.

The mycorrhizal inoculum will be as shown below or an approved equal:

<u>Product</u>	<u>Manufacturer</u>
MycoApply	Mycorrhizal Applications, Inc. Grants Pass, OR Phone: 1-866-476-7800 <a href="http://www.mycorrhizae.com">www.mycorrhizae.com</a>
AM 120 Multi Species Blend	Reforestation Technologies Int. Gilroy, CA Phone: 1-800-784-4769 <a href="http://www.reforest.com">www.reforest.com</a>
LALRISE Prime and Max WP	Lallemand Specialties Inc. Milwaukee, WI Phone: 1-844-590-7781 <a href="http://www.lallemandplantcare.com">www.lallemandplantcare.com</a>

**EROSION CONTROL WATTLE**

Erosion control wattles for restraining the flow of runoff and sediment will be installed at locations noted in the table and at locations determined by the Engineer during construction. Refer to Standard Plate 734.06 for details.

The Contractor will provide certification that the erosion control wattles do not contain noxious weed seeds.

Erosion control wattles will remain on the project to decompose.

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

<http://apps.sd.gov/HC60ApprovedProducts/main.aspx>



**TABLE OF EROSION CONTROL WATTLE**

Station	Diameter (Inch)	Quantity (Ft)
84+00 to 88+21 R	12"	610
85+21 to 87+39 R	12"	308
105+09 to 153+69 R	12"	75
114+52 to 114+89 R	12"	40
115+08 to 115+10 R	12"	40
171+46 to 173+06 L	12"	200
186+75 to 187+49 R	12"	75
201+27 to 202+03 R	12"	75
201+74 to 202+82 R	12"	110
201+79 to 202+16 R	12"	40
202+24 to 202+61 R	12"	40
209+45 to 210+03 R	12"	75
210+40 to 210+69 R	12"	40
Total:		1728

**HIGH FLOW SILT FENCE**

The high flow silt fence fabric provided will be from the approved product list. The approved product list for high flow silt fence may be viewed at the following internet site:

<http://apps.sd.gov/HC60ApprovedProducts/main.aspx>

High flow silt fence will be placed at the locations noted in the table and at locations that will minimize siltation of adjacent streams, lakes, dams, or drainage areas as determined by the Engineer during construction. Refer to Standard Plate 734.05 for details.

An additional quantity of high flow silt fence has been added to the Estimate of Quantities for temporary sediment control.

**TABLE OF HIGH FLOW SILT FENCE**

Station	Location	Quantity (Ft)
88+52 to 88+97 R	Just Inside Easement	107
104+98 to 107+06 R	Just Inside Easement	278
114+39 to 115+59 R	Just Inside Easement	168
153+65 to 154+44 R	Just Inside Easement	85
170+37 to 173+23 L	Just Inside Easement	300
175+55 to 177+32 L	Just Inside Easement	180
186+55 to 187+79 R	Just Inside Easement	124
200+93 to 202+70 R	Just Inside Easement	290
209+38 to 211+21 R	Just Inside Easement	278
Additional Quantity:		150
Total:		1960

**FIBER MULCHING**

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

An additional 2% by weight of tackifier will 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 will be guar gum. If the product selected has synthetic tackifier included, then the additional 2% of tackifier will be synthetic.

Fiber mulch will be applied at the rate of 3,000 pounds per acre.

The Contractor will 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 will be incidental to the contract unit price per ton for "Fiber Mulching".

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

<http://apps.sd.gov/HC60ApprovedProducts/main.aspx>

**TABLE OF FIBER MULCHING**

Station	Location	Area (Acre)	Quantity (Ton)
83+00 to 87+61 R	Inslope	1.4	2.1
105+23 to 107+04 R	Drainage Channel	0.2	0.3
114+82 to 115+06 R	Inslope/ Drainage Channel	0.2	0.3
170+46 to 177+13 L	Drainage Channel	0.8	1.2
186+76 to 187+45 R	Inslope	0.1	0.2
201+78 to 202+58 R	Inslope	0.2	0.2
209+65 to 211+08 R	Inslope	0.3	0.4
Additional Quantity:			0.2
Total:			4.9

**EROSION CONTROL BLANKET**

Erosion control blanket will be installed at the locations noted in the table and at locations determined by the Engineer during construction.

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

<http://apps.sd.gov/HC60ApprovedProducts/main.aspx>

An additional quantity of Type 3 Erosion Control Blanket has been added to the Estimate of Quantities for temporary erosion control.

**TABLE OF EROSION CONTROL BLANKET**

Station	Location	Type	Quantity (SqYd)
83+00 to 87+61 R	Backslope	3	6718
105+23 to 107+04 R	Inslope	3	483
114+53 to 115+56 R	Inslope	3	724
153+76 to 154+20 R	Pipe/Drainage Channel	3	97
170+46 to 177+13 L	Pipe/Drainage Channel	3	3659
186+76 to 187+45 R	Inslope	3	536
201+78 to 202+58 R	Inslope	3	615
209+65 to 211+08 R	Inslope	3	1104
Additional Quantity:		3	500
Total Type 3 Erosion Control Blanket:			14,436

**SHAPING FOR EROSION CONTROL BLANKET**

The ditches will be shaped for the erosion control blanket as specified on Standard Plate 734.01.

**TURF REINFORCEMENT MAT**

Turf Reinforcement Mat will be installed at locations shown in the table at the widths specified, and at locations determined by the Engineer during construction. The Contractor will use a turf reinforcement mat from the approved products list. The approved product list for turf reinforcement mat may be viewed at the following internet site:

<http://apps.sd.gov/HC60ApprovedProducts/main.aspx>

Turf Reinforcement Mat will be installed in accordance with the manufacturer's installation instructions.

**TABLE OF TURF REINFORCEMENT MAT**

Station	Location	Width (Ft)	Type	Quantity (SqYd)
84+31 to 84+49 R	Pipe Inlet	11	2	17
86+28 to 86+58 L	Pipe Inlet	30	2	100
86+81 to 87+33 R	Pipe Outlet/Ditch Channel	21	2	99
170+63 to 170+76 L	Pipe Inlet	11	2	12
Total Type 2 Turf Reinf:				---





**STORMWATER POLLUTION PREVENTION PLAN CHECKLIST**

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

**5.3 (2): STAFF TRAINING/SWPPP IMPLEMENTATION**

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

**5.3 (3): DESCRIPTION OF CONSTRUCTION ACTIVITIES**

- **5.3 (3a): Project Limits** (See Title Sheet)
- **5.3 (3a): Project Description** (See Title Sheet)
- **5.3 (4): Site Map(s)** (See Title Sheet and Plans)
- **Major Soil Disturbing Activities** (check all that apply)
  - Clearing and grubbing
  - Excavation/borrow
  - Grading and shaping
  - Filling
  - Other (describe):
- **5.3 (3b): Total Project Area** 8.0 Acres
- **5.3 (3b): Total Area to be Disturbed** 4.9 Acres
- **5.3 (3c): Maximum Area Disturbed at One Time** 4.9 Acres
- **5.3 (3d): Existing Vegetative Cover (%)** 50%
- **5.3 (3d): Description of Vegetative Cover:** Field Grass
- **5.3 (3e): Soil Properties:** AASHTO Soil or USDA-NRCS Soil Series Classification
- **5.3 (3f): Name of Receiving Water Body/Bodies** Tributary to the Missouri River
- **5.3 (3g): Location of Construction Support Activity Areas** On Site

**5.3 (3h): ORDER OF CONSTRUCTION ACTIVITIES**

The Contractor will enter the Estimated Start Date.

Description	Estimated Start Date
Install stabilized construction entrance(s).	
Install perimeter protection where runoff may exit site.	
Install perimeter protection around stockpiles.	
Install channel and ditch bottom protection.	
Clearing and grubbing.	
Remove and stockpile topsoil.	
Stabilize disturbed areas.	
Install utilities, storm sewers, curb and gutter.	
Install inlet and culvert protection after completing storm drainage and other utility installations.	
Final grading.	
Final paving.	
Removal of protection devices.	
Reseed areas disturbed by removal activities.	

**5.3 (5): DESCRIPTION AND MAINTENANCE OF CONTROL MEASURES**

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

**Perimeter Controls (See Detail Plan Sheets)**

Description	Estimated Start Date
<input type="checkbox"/> Natural Buffers (within 50 ft of Waters of State)	
<input checked="" type="checkbox"/> Silt Fence	
<input checked="" type="checkbox"/> Erosion Control Wattles	
<input type="checkbox"/> Temporary Berm / Windrow	
<input type="checkbox"/> Floating Silt Curtain	
<input type="checkbox"/> Stabilized Construction Entrances	
<input type="checkbox"/> Entrance/Exit Equipment Tire Wash	
<input type="checkbox"/> Other:	

**Structural Erosion and Sediment Controls**

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

**Dust Controls**

Description	Estimated Start Date
<input type="checkbox"/> Tarps & Wind impervious fabrics	
<input type="checkbox"/> Watering	
<input type="checkbox"/> Stockpile location/orientation	
<input type="checkbox"/> Dust Control Chlorides	
<input type="checkbox"/> Other	

**Dewatering BMPs**

Description	Estimated Start Date
<input type="checkbox"/> Sediment Basins	
<input type="checkbox"/> Dewatering bags	
<input type="checkbox"/> Weir tanks	
<input type="checkbox"/> Temporary Diversion Channel	
<input type="checkbox"/> Other:	

**Stabilization Practices (See Detail Plan Sheets)**

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

Description	Estimated Start Date
<input type="checkbox"/> Vegetation Buffer Strips	
<input type="checkbox"/> Temporary Seeding (Cover Crop Seeding)	
<input checked="" type="checkbox"/> Permanent Seeding	
<input type="checkbox"/> Sodding	
<input type="checkbox"/> Planting (Woody Vegetation for Soil Stabilization)	
<input type="checkbox"/> Mulching (Grass Hay or Straw)	
<input checked="" type="checkbox"/> Fiber Mulching (Wood Fiber Mulch)	
<input type="checkbox"/> Soil Stabilizer	
<input type="checkbox"/> Bonded Fiber Matrix	
<input type="checkbox"/> Fiber Reinforced Matrix	
<input checked="" type="checkbox"/> Erosion Control Blankets	
<input type="checkbox"/> Surface Roughening (e.g. tracking)	
<input type="checkbox"/> Other:	

**Wetland Avoidance**

Will construction and/or erosion and sediment controls im wetlands? Yes  No  If yes, the structural and erasic controls have been included in the total project wetland in been included in the 404 permit process with the USACE.



**5.3 (6): PROCEDURES FOR INSPECTIONS**

- Inspections will be conducted at least once every 7 days.
- All controls will be maintained in good working order. Necessary repairs will be initiated within 24 hours of the site inspection report.
- Silt fence will be inspected for depth of sediment and for tears to ensure the fabric is securely attached to the posts and that the posts are well anchored. Sediment buildup will be removed from the silt fence when it reaches 1/3 of the height of the silt fence.
- Sediment basins and traps will be checked. Sediment will be removed when depth reaches approximately 50 percent of the structure's capacity, and at the conclusion of the construction.
- Check dams will be inspected for stability. Sediment will be removed when depth reaches 1/2 the height of the dam.
- All seeded areas will be checked for bare spots, washouts, and vigorous growth free of significant weed infestations.
- Inspection and maintenance reports will be prepared on form DOT 298 for each site inspection, this form will also be used to document changes to the SWPPP. A copy of the completed inspection form will be filed with the SWPPP documents.
- The SDDOT Project Engineer and Contractor's Erosion Control Supervisor are responsible for inspections. Maintenance and repair activities are the responsibility of the Contractor. The SDDOT Project Engineer will complete the inspection and maintenance reports and distribute copies per the distribution instructions on DOT 298.

**5.3 (7): POST CONSTRUCTION STORMWATER MANAGEMENT**

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

**5.3 (8): POLLUTION PREVENTION PROCEDURES**

**5.3 (8a): Spill Prevention and Response Procedures**

➤ **Material Management**

▪ Housekeeping

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

▪ Hazardous Materials

- Products will be kept in original containers unless the container is not resealable and provide secondary containment as applicable.
- Original labels and material safety data sheets will be retained in a safe place to relay important product information.

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

➤ **Spill Control Practices**

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

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

➤ **Spill Response**

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

- The Contractor's site superintendent will be notified immediately when a spill or the threat of a spill is observed. The superintendent will assess the situation and determine the appropriate response.
- If spills represent an imminent threat of escaping erosion and sediment controls and entering receiving waters, personnel will be directed to respond immediately to contain the release and notify the superintendent after the situation has been stabilized.

- Spill kits containing appropriate materials and equipment for spill response and cleanup will be maintained by the Contractor at the site.
- If oil sheen is observed on surface water (e.g. settling ponds, detention ponds, swales), action will be taken immediately to remove the material causing the sheen. The Contractor will use appropriate materials to contain and absorb the spill. The source of the oil sheen will also be identified and removed or repaired as necessary to prevent further releases.
- If a spill occurs the superintendent or the superintendent's designee will be responsible for completing the spill reporting form and for reporting the spill to SDDANR.
- Personnel with primary responsibility for spill response and cleanup will receive training by the Contractor's site superintendent or designee. The training must include identifying the location of the spill kits and other spill response equipment and the use of spill response materials.
- Spill response equipment will be inspected and maintained as necessary to replace any materials used in spill response activities.

**5.3 (8b): WASTE MANAGEMENT PROCEDURES**

➤ **Waste Disposal**

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

➤ **Hazardous Waste**

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

➤ **Sanitary Waste**

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



**5.3 (9): CONSTRUCTION SITE POLLUTANTS**

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

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

**Product Specific Practices**

▪ **Petroleum Products**

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

▪ **Fertilizers**

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

▪ **Paints**

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

▪ **Concrete Trucks**

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

**5.3 (10): NON-STORMWATER DISCHARGES**

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

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

**5.3 (11): INFEASIBILITY DOCUMENTATION**

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

**7.0: SPILL NOTIFICATION**

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

- A release or spill of a regulated substance (includes petroleum and petroleum products) must be reported to SDDANR immediately **if any one of the following** conditions exists:
  - The release or spill threatens or is able to threaten waters of the state (surface water or ground water)
  - The release or spill causes an immediate danger to human health or safety
  - The release or spill exceeds 25 gallons
  - The release or spill causes a sheen on surface water
  - The release or spill of any substance that exceeds the ground water quality standards of ARSD Chapter 74:54:01
  - The release or spill of any substance that exceeds the surface water quality standards of ARSD Chapter 74:51:01
  - The release or spill of any substance that harms or threatens to harm wildlife or aquatic life
  - The release or spill is required to be reported according to Superfund Amendments and Reauthorization Act (SARA) Title III List of Lists, Consolidated List of Chemicals Subject to Reporting Under the Emergency Planning and Community Right to Know Act, US Environmental Protection Agency.
- To report a release or spill, call SDDANR at 605-773-3296 during regular office hours (8 a.m. to 5 p.m. Central Standard Time). To report the release after hours, on weekends or holidays, call South Dakota Emergency Management at 605-773-3231. Reporting the release to SDDANR does not meet any obligation for reporting to other state, local, or federal agencies. Therefore, you must also contact local authorities to determine the local reporting requirements for releases. A written report of the unauthorized release of any regulated substance, including quantity discharged, and the location of the discharge will be sent to SDDANR within 14 days of the discharge.

**5.4: SWPPP CERTIFICATIONS**

➤ **Certification of Compliance with Federal, State, and Local Regulations**

The Storm Water Pollution Prevention Plan (SWPPP) for this project reflects the requirements of all local municipal jurisdictions for storm water management and sediment and erosion control as established by ordinance, as well as other state and federal requirements for sediment and erosion control plans, permits, notices or documentation as appropriate.

➤ **South Dakota Department of Transportation**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Authorized Signature (See the General Permit, Section 7.4 (1))

➤ **Prime Contractor**

This section is to be executed by the General Contractor after the award of the contract. This section may be executed any time there is a change in the Prime Contractor of the project.

I certify under penalty of law that this document and all attachments will be revised or maintained under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Authorized Signature



STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0014(238)203	16	65

**CONTACT INFORMATION**

The following personnel are duly authorized representatives and have signatory authority for modifications made to the SWPPP:

➤ **Contractor Information:**

- Prime Contractor Name: \_\_\_\_\_
- Contractor Contact Name: \_\_\_\_\_
- Address: \_\_\_\_\_
- \_\_\_\_\_
- City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_
- Office Phone: \_\_\_\_\_ Field: \_\_\_\_\_
- Cell Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

➤ **Erosion Control Supervisor**

- Name: \_\_\_\_\_
- Address: \_\_\_\_\_
- \_\_\_\_\_
- City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_
- Office Phone: \_\_\_\_\_ Field: \_\_\_\_\_
- Cell Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

➤ **SDDOT Project Engineer**

- Name: \_\_\_\_\_
- Business Address: \_\_\_\_\_
- Job Office Location: \_\_\_\_\_
- City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_
- Office Phone: \_\_\_\_\_ Field: \_\_\_\_\_
- Cell Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

➤ **SDDANR Contact Spill Reporting**

- Business Hours Monday-Friday (605) 773-3296
- Nights and Weekends (605) 773-3231

➤ **SDDANR Contact for Hazardous Materials.**

- (605) 773-3153

➤ **National Response Center Hotline**

- (800) 424-8802.

➤ **SDDANR Stormwater Contact Information**

- SDDANR Stormwater (800) 737-8676
- Surface Water Quality Program (605) 773-3351

**5.5: REQUIRED SWPPP MODIFICATIONS**

➤ **5.5 (1): Conditions Requiring SWPPP Modification**

The SWPPP must be modified, including the site map(s), in response to any of the following conditions:

- When a new operator responsible for implementation of any part the SWPPP begins work on the site.
- When changes to the construction plans, sediment and erosion control measures, or any best management practices on site that are no longer accurately reflected in the SWPPP. This includes changes made in response to corrective actions triggered by inspections.
- To reflect areas on the site map where operational control has been transferred (including the date of the transfer) or has been covered under a new permit since initiating coverage under this general permit.
- If inspections by site staff, local officials, SDDANR, or U.S. EPA determine that SWPPP modifications are necessary for compliance with the Stormwater Permit.
- To reflect any revisions to applicable federal, state, or local requirements that affect the control measures implemented at the site.
- If approved by the Secretary, to reflect any changes in chemical water treatment systems or controls, including the use of a different water treatment chemical, age rates, different areas, or methods of application.

➤ **5.5 (2): Deadlines for SWPPP Modification**

Any required revisions to the SWPPP must be completed within 7 calendar days following any of the items listed above.

➤ **5.5 (3): Documentation of Modifications to the Plan**

All SWPPP modification records are required to be maintained showing the dates of when the modification occurred. The records must include the name of the person authorizing each change and a brief summary of all changes.

➤ **5.5 (4): Certification Requirements**

All modifications made to the SWPPP must be signed and certified as required in Section 7.4.

➤ **5.5 (5): Required Notice to Other Operators**

If there are multiple operators at the site, the Contractor's Erosion Control Supervisor must notify each operator that may be impacted by the change to the SWPPP within 24 hours.

When modifications as described above occur, the SWPPP will be modified to provide appropriate protection to disturbed areas, all storm water structures, and adjacent waters. The SDDOT Project Engineer will modify the SWPPP using the DOT 298 form and drawings on the plan will be modified to reflect the needed changes. Copies of the DOT 298 forms and the SWPPP will be retained on site in a designated place for review throughout the course of the project. A copy of the DOT 298 form will be given to the Contractor Erosion Control Supervisor and a copy will be emailed to the SDDOT Environmental Section in accordance with the DOT 298 Form.

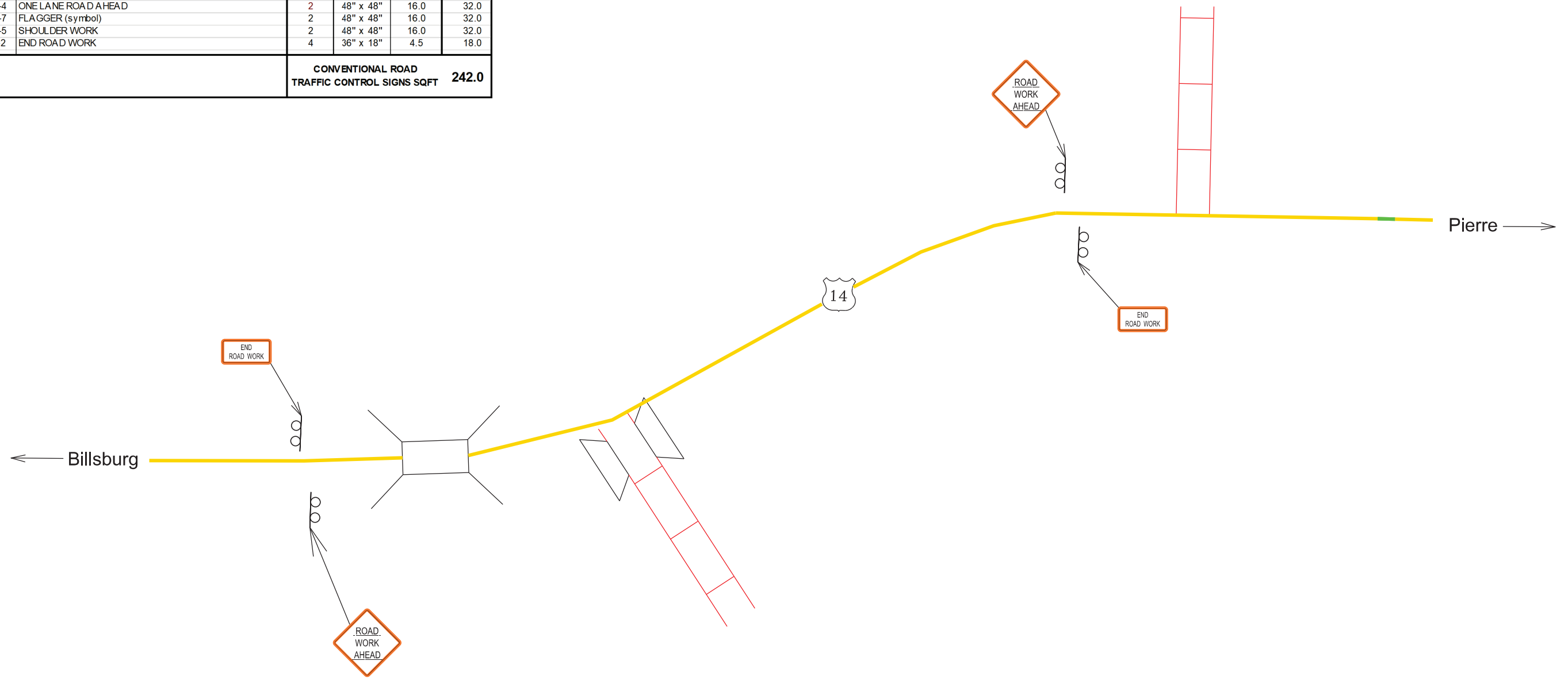




# Fixed Location Signing FOR BIDDING PURPOSES ONLY

Plotting Date: 04-04-2024

SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W3-4	BE PREPARED TO STOP	2	48" x 48"	16.0	32.0
W8-6	TRUCK CROSSING	2	48" x 48"	16.0	32.0
W20-1	ROAD WORK AHEAD	4	48" x 48"	16.0	64.0
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	2	48" x 48"	16.0	32.0
W21-5	SHOULDER WORK	2	48" x 48"	16.0	32.0
G20-2	END ROAD WORK	4	36" x 18"	4.5	18.0
<b>CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT</b>					<b>242.0</b>



Plot Scale - 1:200

Plotted From - evanwolf

File - ...Fixed Location Signing.dgn

Plot Scale - 1:100










































Plotted From - svdnevmarczak

# EROSION AND SEDIMENT CONTROL LEGEND

FOR BIDDING PURPOSES ONLY

 STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0014(238)203	18	65
Plotting Date: 04-04-2024			

## SYMBOLGY FOR BEST MANAGEMENT PRACTICES

-  STORM WATER DISCHARGE POINT
-  LOW FLOW SILT FENCE
-  HIGH FLOW SILT FENCE
-  SILT TRAP
-  SEDIMENT CONTROL AT INLET WHEN SURFACING IS IN PLACE
-  TEMPORARY SEDIMENT BARRIER
-  TEMPORARY WATER BARRIER
-  FLOATING SILT CURTAIN
-  SEDIMENT FILTER BAGS
-  TRIANGULAR SILT BARRIERS
-  EROSION CONTROL WATTLES
-  EROSION BALES
-  SURFACE ROUGHENING
-  SOIL STABILIZER / TEMPORARY MULCH / DUST CONTROL
-  CUT INTERCEPTOR DITCH
-  TEMPORARY SLOPE DRAIN
-  SEDIMENT CONTROL AT INLET BEFORE PLACEMENT OF SURFACING
-  HYDRAULIC STRAW MULCH / FIBER MULCHING / BONDED FIBER MATRIX / FIBER REINFORCED MATRIX
-  ROCK CHECK DAM
-  SODDING
-  TYPE 1 EROSION CONTROL BLANKET
-  TYPE 2 EROSION CONTROL BLANKET
-  TYPE 3 EROSION CONTROL BLANKET
-  TYPE 4 EROSION CONTROL BLANKET
-  TYPE 1 TURF REINFORCEMENT MAT
-  TYPE 2 TURF REINFORCEMENT MAT
-  TYPE 3 TURF REINFORCEMENT MAT
-  SYNTHETIC CHANNEL PROTECTION
-  (TS) TOPSOIL STOCKPILES
-  (B) BORROW AREAS
-  (CE) STABILIZED CONSTRUCTION ENTRANCES
-  (CW) CONCRETE WASHOUTS
-  (BS) VEGETATED BUFFER STRIPS
-  (AP) ASPHALT PLANT SITE
-  (CP) CONCRETE PLANT SITE
-  (M) ON-SITE CONSTRUCTION MATERIAL STORAGE AREAS
-  (SK) SPILL KIT
-  (WP) WORK PLATFORM
-  (TP) PORTABLE TOILET
-  (V) VEHICLE AND EQUIPMENT PARKING, FUELING, AND MAINTENANCE AREAS
-  (D) DUMPSTER OR OTHER TRASH AND DEBRIS CONTAINERS

## BEST MANAGEMENT PRACTICES

BEST MANAGEMENT PRACTICES (BMP'S) SHOULD BE USED THROUGHOUT CONSTRUCTION. TO REMIND CONTRACTORS AND FIELD PERSONNELL THAT BMP'S FOR WATER QUALITY SHOULD BE UTILIZED THROUGHOUT THE CONSTRUCTION PROCESS. THE SYMBOLGY IS COLORED AS FOLLOWS:

**RED BMP'S ARE TO BE INSTALLED BEFORE EARTH MOVING ACTIVITIES COMMENCE. RED BMP'S ARE USED FOR PERIMETER CONTROL. THEY PREVENT SEDIMENT FROM LEAVING THE SITE OR ENTERING FROM ANOTHER SITE. THEY MAY ALSO DETER WATER AWAY FROM OR AROUND THE SITE. THEY MAY BE LEFT IN PLACE AND MAINTAINED FOR THE REMAINDER OF CONSTRUCTION OR UNTIL VEGETATION HAS REACHED 70% OF THE BACKGROUND LEVEL.**

**BLUE BMP'S ARE TO BE INSTALLED DURING CONSTRUCTION. BLUE BMP'S ARE USED FOR TEMPORARY STABILIZATION. THEY PREVENT EROSION DURING CONSTRUCTION. THEY MAY ALSO BE SEDIMENT CONTROLS UTILIZED AFTER DRAIN PIPES AND STORM SEWERS ARE IN PLACE. THEY MAY BE LEFT IN PLACE AND MAINTAINED FOR THE REMAINDER OF CONSTRUCTION OR UNTIL VEGETATION HAS REACHED 70% OF THE BACKGROUND LEVEL. SOME YELLOW BMP'S WILL BE REMOVED OR REPLACED DURING CONSTRUCTION.**

**GREEN BMP'S ARE TO BE INSTALLED WHEN GRADING IS COMPLETE. GREEN BMP'S ARE USED FOR FINAL STABILIZATION. THEY ARE PERMANENT EROSION CONTROL MEASURES THAT ARE NOT REMOVED.**

IF THE CONTRACTOR OR ENGINEER DECIDE TO USE ADDITIONAL BEST MANAGEMENT PRACTICES OR LABEL THE LOCATIONS OF THEM THEY SHOULD USE THE SYMBOLGY SHOWN. OTHER BEST MANAGEMENT PRACTICES FOR WHICH THERE IS NO SYMBOLGY INCLUDE:

PERMANENT SEEDING IS DONE BEFORE THE APPLICATION OF ALL TYPES OF MULCHING AND HYDRAULICALLY APPLIED SOIL MULCHES AND MATRIXS. PERMANENT GRASS HAY/ STRAW MULCH IS NOT SHOWN ON PLAN SHEETS, BUT IT CAN BE ASSUMED THAT ALL AREAS THAT ARE NOT ROADWAYS ON RURAL PROJECTS WILL BE SEEDED THEN MULCHED. AREAS WHERE AN ALTERNATE TO GRASS HAY /STRAW MULCH IS USED WILL BE SHOWN WITH THE APPROPRIATE SYMBOLGY.

SEDIMENT BASINS UTILIZED DURING CONSTRUCTION WILL BE SHOWN ON PLAN SHEETS AND IN SECTION X.

GEOTEXTILE FABRIC USUALLY SUPPLEMENTS OTHER BMP'S, BUT IT MAY BE USED TO TEMPORARILY COVER AREAS FOR EROSION PROTECTION UNTIL IT IS PERMANENTLY INSTALLED.

STREET SWEEPING SHOULD BE DONE AS NEEDED TO KEEP SEDIMENT ON ROADWAYS FROM LEAVING THE SITE.

DEWATERING AND SEDIMENT COLLECTING IS SHOWN ON A DETAIL SHEET WHEN IT IS NEEDED. DEWATERING WITHOUT SEDIMENT COLLECTING DOES NOT HAVE A DETAIL, JUST A DETAILED NOTE. SEDIMENT LADEN WATER SHOULD NEVER BE PUMPED OFF THE SITE.

GABIONS AND RIP RAP AT PIPE AND CULVERT OUTLETS ARE DETAILED IN SECTION B.


## PROJECT PHASING

PROJECT PHASING MAY BE ONE OF THE MOST IMPORTANT BMP'S. DURING PHASING REMEMBER THE FOLLOWING:

- ALWAYS INSTALL PERIMETER CONTROLS BEFORE BEGINING EARTH MOVING ACTIVITIES.
- DO NOT DISTURB MORE AREA THAN WHAT IS NEEDED TO COMPLETE EACH PHASE OF CONSTRUCTION.
- IF POSSIBLE CONSTRUCT SEDIMENT BASINS AND STABILIZE THEM BEFORE BEGINNING ROADWAY GRADING.
- TEMPORARILY STABILIZE AREAS THAT WILL NOT BE TOUCHED WITHIN 14 DAYS.
- PERMANENTLY STABILIZE AREAS WHEN GRADING IN THAT AREA IS COMPLETE. PERMANENT STABILIZATION CAN BE COMPLETED IN PHASES AND DOES NOT HAVE TO WAIT UNTIL THE WHOLE ROADWAY HAS BEEN CONSTRUCTED.
- CONTINUALLY MAINTAIN ALL SEDIMENT CONTROLS AND MONITOR AREAS WHERE EROSION CONTROL HAS BEEN INSTALLED.

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# EROSION AND SEDIMENT CONTROL PLAN FOR BIDDING PURPOSES ONLY

 STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0014(238)203	19	65
Plotting Date: 5/7/2024			

## PERIMETER CONTROL

Install High Flow Silt Fence at the following locations:  
88+52 to 88+97 R Just inside easement 107 Ft

## TEMPORARY STABILIZATION

Install 12" Diameter Erosion Control Wattles at the following locations:  
84+00 to 88+21 R on inslope spaced 50' 610 Ft  
85+21 to 87+39 R on inslope spaced 35' 308 Ft

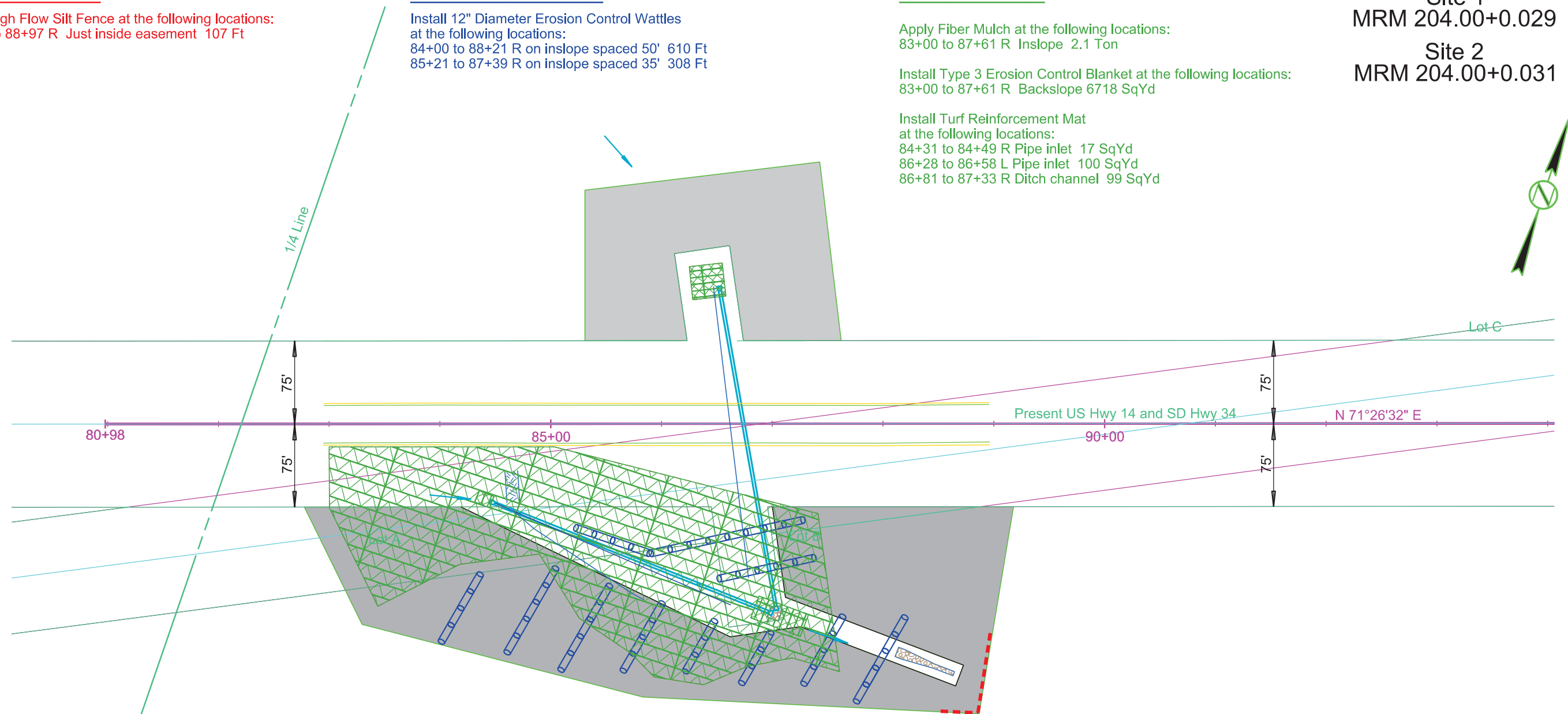
## FINAL STABILIZATION

Apply Fiber Mulch at the following locations:  
83+00 to 87+61 R Inslope 2.1 Ton

Install Type 3 Erosion Control Blanket at the following locations:  
83+00 to 87+61 R Backslope 6718 SqYd

Install Turf Reinforcement Mat at the following locations:  
84+31 to 84+49 R Pipe inlet 17 SqYd  
86+28 to 86+58 L Pipe inlet 100 SqYd  
86+81 to 87+33 R Ditch channel 99 SqYd

Site 1  
MRM 204.00+0.029  
Site 2  
MRM 204.00+0.031



Plot Scale - 1:100

Plotted From - evanwolf

File - ...Erosion Control081.ecadgn



# EROSION AND SEDIMENT CONTROL PLAN FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0014(238)203	20	65
Plotting Date: 5/7/2024			

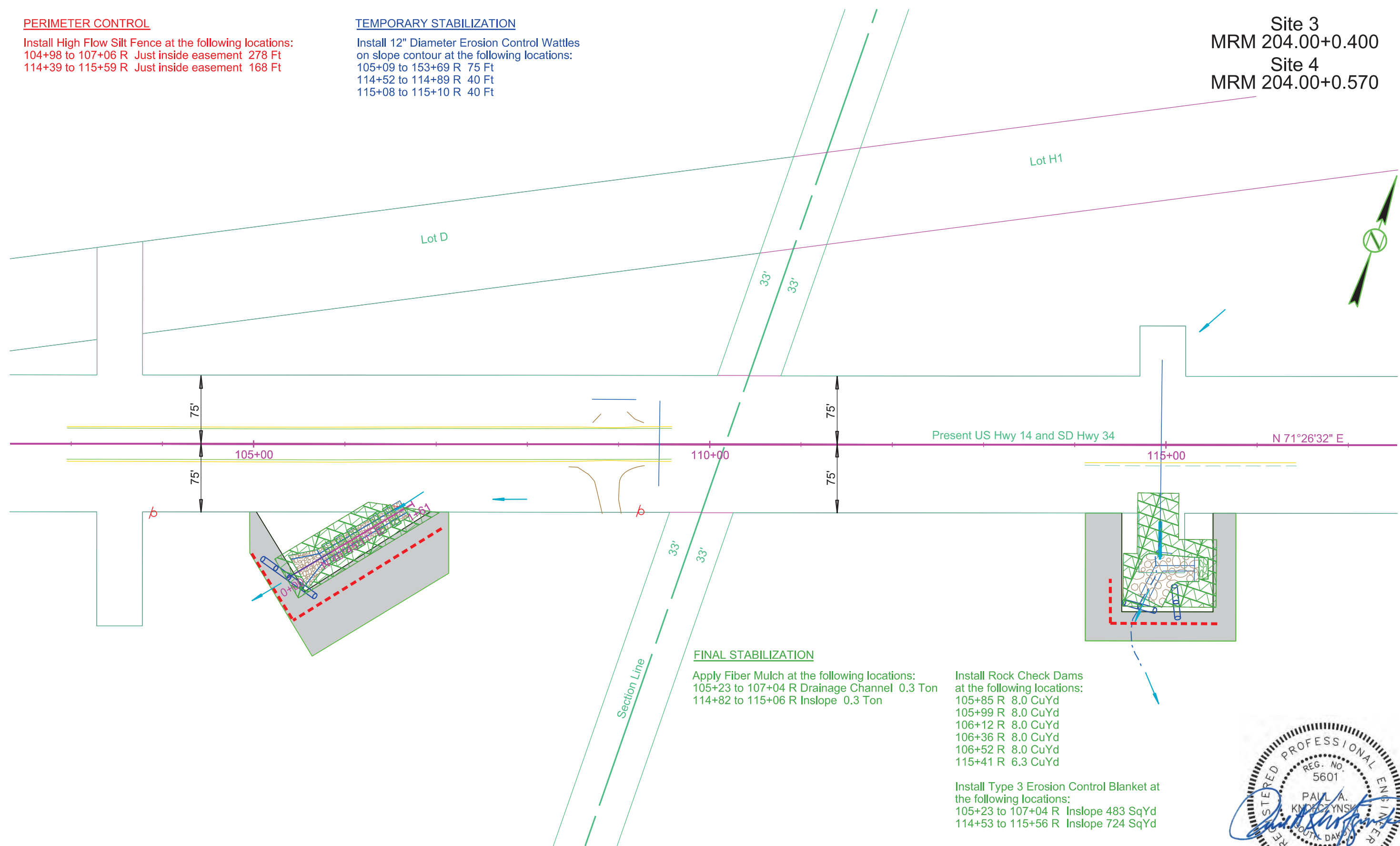
**PERIMETER CONTROL**

Install High Flow Silt Fence at the following locations:  
 104+98 to 107+06 R Just inside easement 278 Ft  
 114+39 to 115+59 R Just inside easement 168 Ft

**TEMPORARY STABILIZATION**

Install 12" Diameter Erosion Control Wattles on slope contour at the following locations:  
 105+09 to 153+69 R 75 Ft  
 114+52 to 114+89 R 40 Ft  
 115+08 to 115+10 R 40 Ft

**Site 3**  
 MRM 204.00+0.400  
**Site 4**  
 MRM 204.00+0.570



**FINAL STABILIZATION**

Apply Fiber Mulch at the following locations:  
 105+23 to 107+04 R Drainage Channel 0.3 Ton  
 114+82 to 115+06 R Inslope 0.3 Ton

Install Rock Check Dams at the following locations:  
 105+85 R 8.0 CuYd  
 105+99 R 8.0 CuYd  
 106+12 R 8.0 CuYd  
 106+36 R 8.0 CuYd  
 106+52 R 8.0 CuYd  
 115+41 R 6.3 CuYd

Install Type 3 Erosion Control Blanket at the following locations:  
 105+23 to 107+04 R Inslope 483 SqYd  
 114+53 to 115+56 R Inslope 724 SqYd



Plotted From: - evanwolf  
 Plot Scale: - 1:100.227  
 File: - ...Erosion Control101.ec.dgn

# EROSION AND SEDIMENT CONTROL PLAN FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	PT 0014(238)203	21	65

Plotting Date: 5/7/2024

**Site 5**  
 MRM 205.00+0.152  
  
**Site 6**  
 MRM 205.00+0.310

**PERIMETER CONTROL**

Install High Flow Silt Fence at the following locations:  
 153+65 to 154+44 R Just inside easement 85 Ft

**FINAL STABILIZATION**

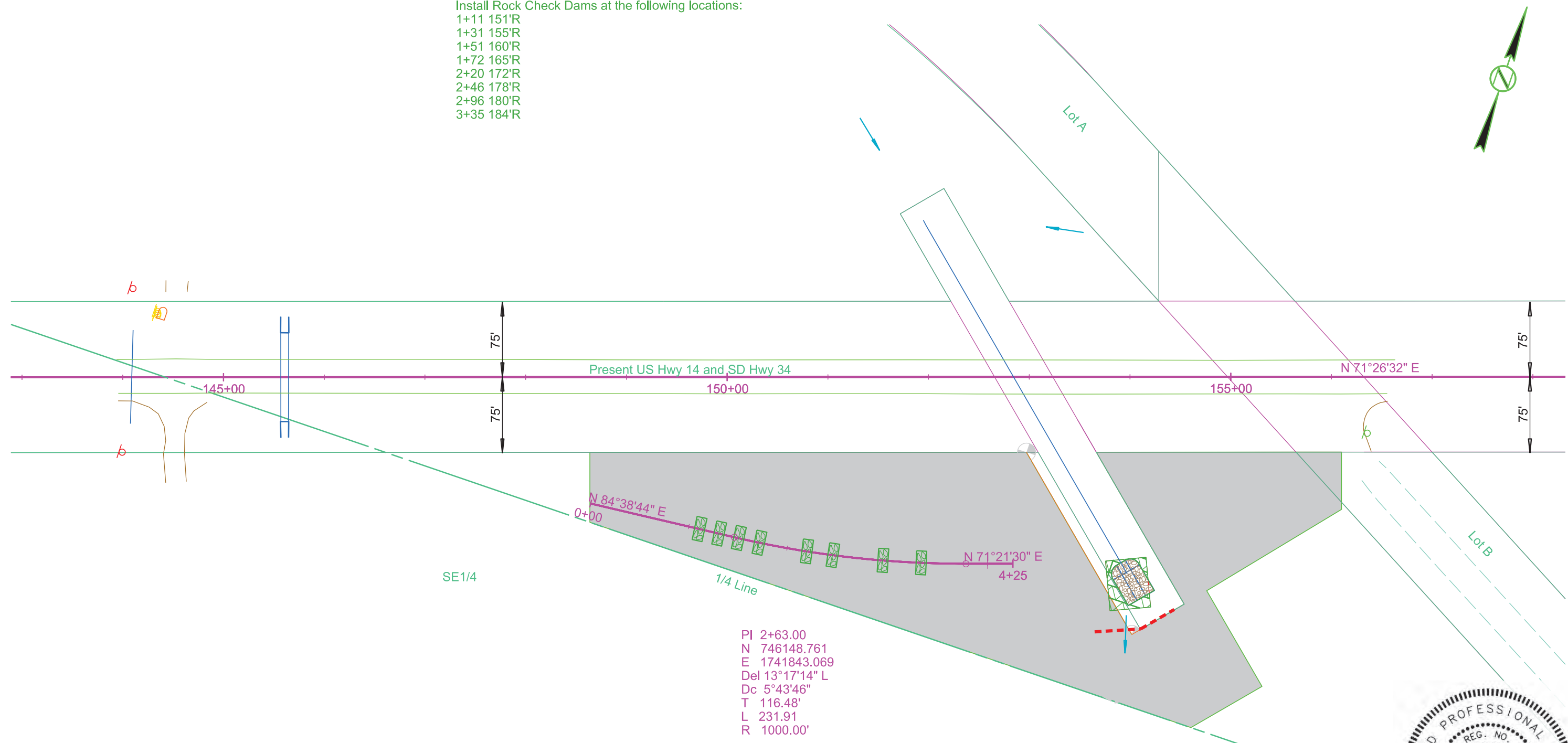
Install Type 3 Erosion Control Blanket at the following locations:  
 153+76 to 154+20 R 97 SqYd

Install Rock Check Dams at the following locations:

- 1+11 151'R
- 1+31 155'R
- 1+51 160'R
- 1+72 165'R
- 2+20 172'R
- 2+46 178'R
- 2+96 180'R
- 3+35 184'R

Plot Scale - 1:100

Plotted From - evanwolf



PI 2+63.00  
 N 746148.761  
 E 1741843.069  
 Del 13°17'14" L  
 Dc 5°43'46"  
 T 116.48'  
 L 231.91  
 R 1000.00'



File - ...Erosion Control\142ec.dgn

# EROSION AND SEDIMENT CONTROL PLAN FOR BIDDING PURPOSES ONLY

 STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	PT 0014(238)203	22	65

Plotting Date: 5/7/2024

## PERIMETER CONTROL

Install High Flow Silt Fence at the following locations:  
 170+37 to 173+23 L Just inside easement 300 Ft  
 175+55 to 177+32 L Just inside easement 180 Ft

## TEMPORARY STABILIZATION

Install 12" Diameter Erosion Control Wattles on slope contour at the following location:  
 171+46 to 173+06 L On inslope spaced 50' 200 Ft

## FINAL STABILIZATION

Apply Fiber Mulch at the following locations:  
 170+46 to 177+13 L 1.2 Ton

Install Turf Reinforcement Mat in the highway ditch channel bottom  
 170+63 to 170+76 L 12 SqYd

Install Type 3 Erosion Control Blanket in the highway ditch channel bottom at the following locations:  
 170+46 to 177+13 L 3659 SqYd

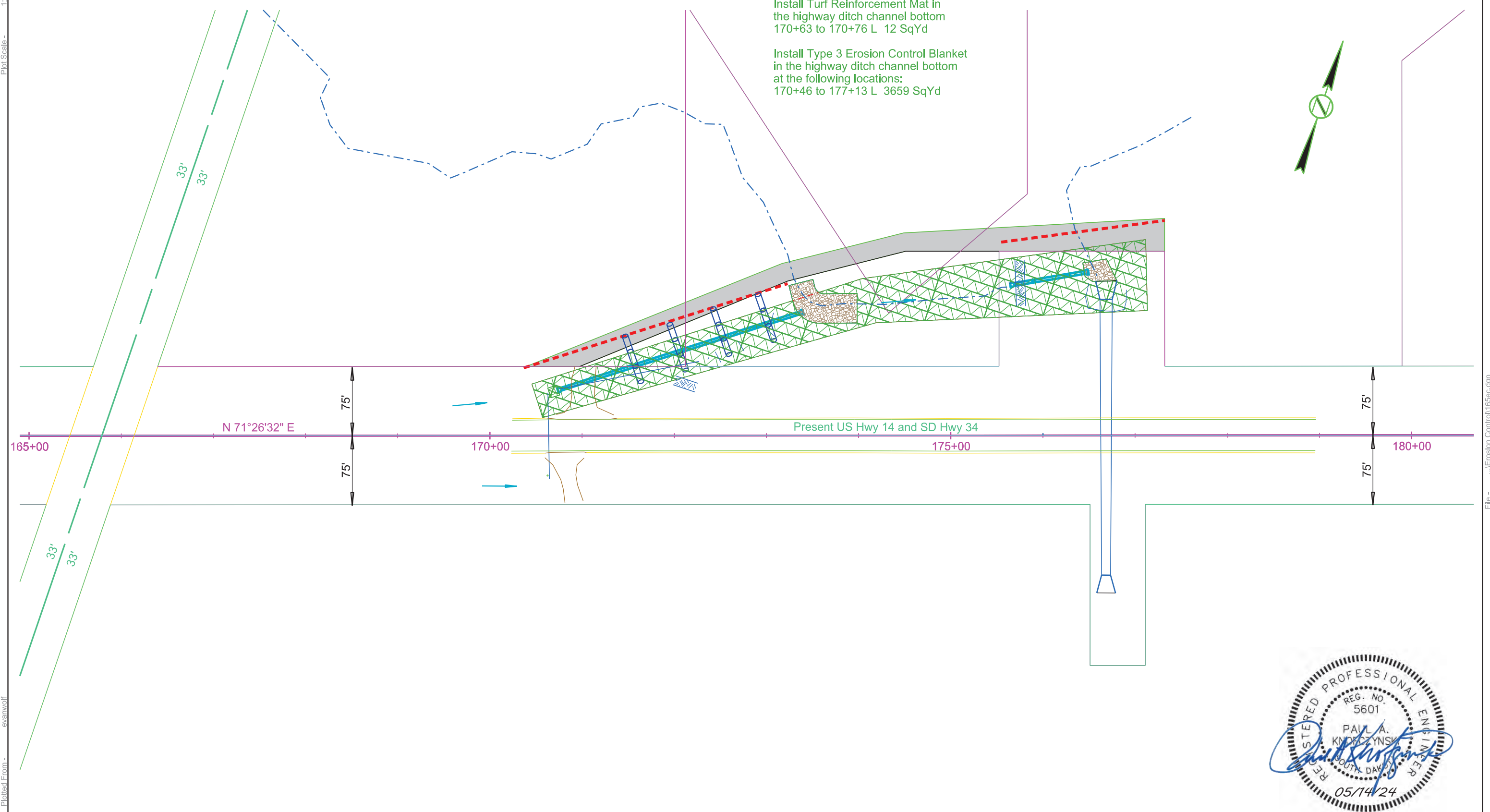
Site 7  
 MRM 205.00+0.730




Plot Scale - 1:100

Plotted From - evanwolf

File - ...Erosion Control165ec.dgn



# EROSION AND SEDIMENT CONTROL PLAN FOR BIDDING PURPOSES ONLY

 STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0014(238)203	23	65

Plotting Date: 5/7/2024

Site 8  
MRM 205.00+0.937

**PERIMETER CONTROL**

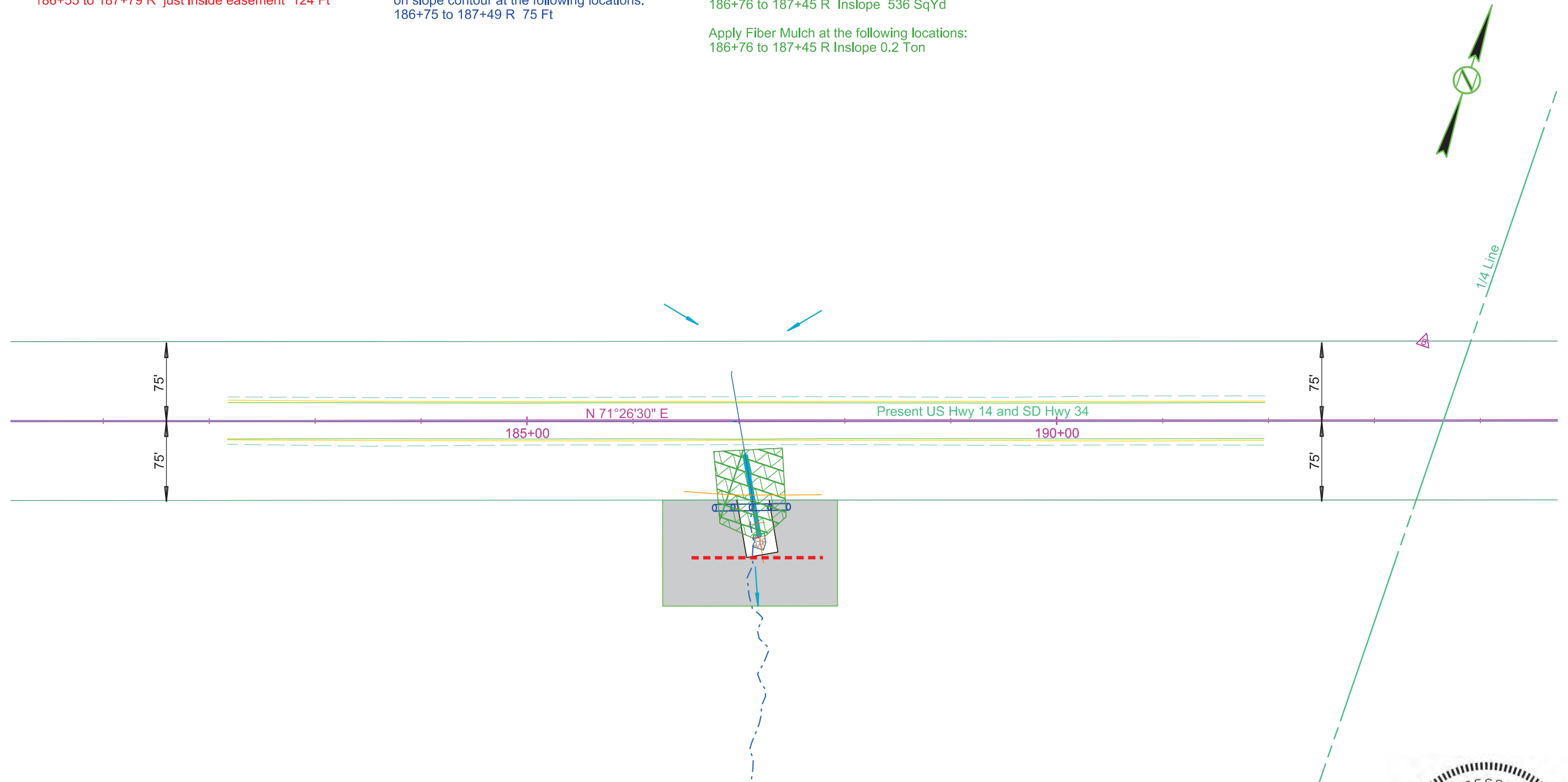
Install High Flow Silt Fence at the following locations:  
186+55 to 187+79 R just inside easement 124 Ft

**TEMPORARY STABILIZATION**

Install 12" Diameter Erosion Control Wattles on slope contour at the following locations:  
186+75 to 187+49 R 75 Ft

**FINAL STABILIZATION**

Install Type 3 Erosion Control Blanket at the following locations:  
186+76 to 187+45 R Inslope 536 SqYd  
  
Apply Fiber Mulch at the following locations:  
186+76 to 187+45 R Inslope 0.2 Ton



Plot Scale - 1:100

Plotted From - evanwolf

File - ...Erosion Control\180ec.dgn

# EROSION AND SEDIMENT CONTROL PLAN FOR BIDDING PURPOSES ONLY

KJ STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0014(238)203	24	65

Plotting Date: 5/7/2024

Site 9  
MRM 206.00+0.208  
Site 10  
MRM 206.00+0.335

## PERIMETER CONTROL

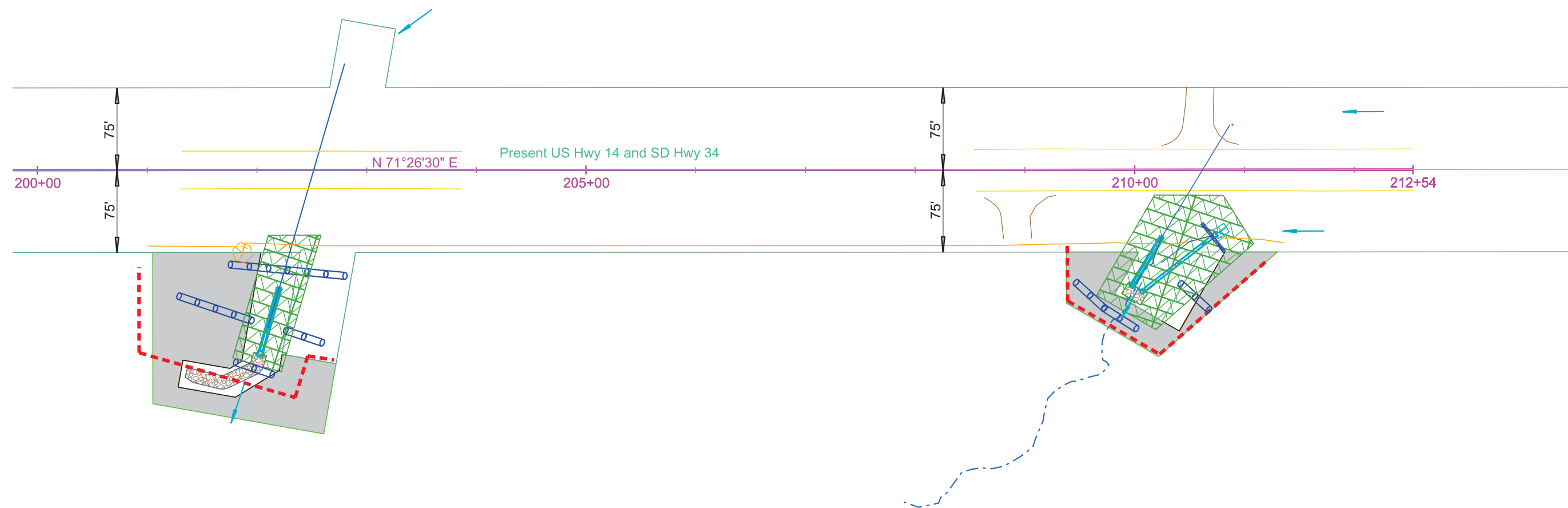
Install High Flow Silt Fence at the following locations:  
200+93 to 202+70 R just inside easement 290 Ft  
209+38 to 211+21 R just inside easement 278 Ft

## TEMPORARY STABILIZATION

Install 12" Diameter Erosion Control Wattles on slope contour at the following locations:  
201+27 to 202+03 R 75 Ft  
201+74 to 202+82 R 110 Ft  
201+79 to 202+16 R 40 Ft  
202+24 to 202+61 R 40 Ft  
209+45 to 210+03 R 75 Ft  
210+40 to 210+69 R 40 Ft

## FINAL STABILIZATION

Apply Fiber Mulch at the following locations:  
201+78 to 202+58 R Inslope 0.2 Ton  
209+65 to 211+08 R Inslope 0.4 Ton  
Install Type 3 Erosion Control Blanket at the following locations:  
201+78 to 202+58 R Inslope 615 SqYd  
209+65 to 211+08 R Inslope 1104 SqYd



Plot Scale - 1:100

Plotted From - evanwolf

File - ...Erosion Control\197ec.dgn



# HORIZONTAL ALIGNMENT DATA

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT PT 0014(238)203	SHEET 25	TOTAL SHEETS 65
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## MAINLINE

<u>Type</u>	<u>Station</u>	<u>Northing</u>	<u>Easting</u>
POB	80+97.82	744089.71	1835126.39
	TL= 13155.85    N 71°26'30" E		
POE	212+53.67	748276.85	1847598.13

### Pipe at Sta. 82+69 Rt. (Site 1)

<u>Type</u>	<u>Station</u>	<u>Northing</u>	<u>Easting</u>
POB	0+00.00	744135.25	1835450.93
	TL= 329.73    S 86°53'55" E		
POE	3+29.73	744117.41	1835780.17

### Check Dams at Sta. 104+00 Rt. (Site 3)

<u>Type</u>	<u>Station</u>	<u>Northing</u>	<u>Easting</u>
POB	0+00.00	744726.14	1837484.97
	TL= 160.52    N 40°45'11" E		
POE	1+60.52	744847.74	1837589.76

### Check Dams at Sta. 149+00 Rt. (Site 5)

<u>Type</u>	<u>Station</u>	<u>Northing</u>	<u>Easting</u>
POB	0+00.00	746124.218	1841581.213
	TL= 146.53    N 84°38'44" E		
PC	1+46.53	746137.891	1841727.102
PI	2+63.00	746148.761	1841843.069
	R= 1000.00    Delta= 13°17'14"L		
PT	3+78.43	746185.992	1841953.433
	TL= 46.57    N 71°21'30" E		
POE	4+25.00	746200.876	1841997.557

### Ditch Channel at Sta. 173+30 to 174+90 Lt. (Site 7)

<u>Type</u>	<u>Station</u>	<u>Northing</u>	<u>Easting</u>
POB	0+00.00	747218.47	1843986.75
	TL= 250.00    N 72°02'26" E		
POE	2+50.00	747339.68	1844205.40

The coordinates shown on this sheet are based on the South Dakota State Plane Coordinate System. North Zone NAD 83(2011); epoch 2010.00; Geoid 18; SF = 0.999901



# CONTROL DATA

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	PT 0014(238)203	26	65

HORIZONTAL AND VERTICAL CONTROL POINTS						
POINT	STATION	OFFSET	DESCRIPTION	NORTHING	EASTING	ELEVATION
CP	170+00		Nail	746964.096	1843758.389	1899.336
CP	210+00		Nail	748237.261	1847550.483	1974.634
CP	142+00		Nail	746073.573	1841103.594	1974.871
BL7 CP	146+00		Nail	746200.653	1841482.822	1968.204
BL7 CP	150+00		Nail	746327.955	1841862.989	1957.685
BL7 CP	152+00	22.0' R		746391.224	1842051.634	1950.886
CP	84+00	22.0' R	Nail	744227.716	1835605.652	1949.223
CP	82+00	22.0' R	Nail	744163.508	1835415.771	1957.137
CP			Rebar/Cap	743089.558	1840585.882	1992.749
CP	102+00	22.0' R	Nail	744800.172	1837312.006	1896.083
CP	108+00	22.0' R	Nail	744991.11	1837880.293	1901.424

The coordinates shown on this sheet are based on the South Dakota State Plane Coordinate System. North Zone NAD 83(2011); epoch 2010.00  
 Geoid 18; SF = 0.999901  
 The elevations shown on this sheet are based on NAVD 88.



# LEGEND

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	PT 0014(238)203	27	65

Plotting Date: 5/7/2024

Anchor		Mailbox		Subsurface Utility Exploration Test Hole		State and National Line	
Antenna		Manhole Electric		Telephone Fiber Optics		County Line	
Approach		Manhole Gas		Telephone Junction Box		Section Line	
Assumed Corner		Manhole Miscellaneous		Telephone Pole		Quarter Line	
Azimuth Marker		Manhole Sanitary Sewer		Television Cable Jct Box		Sixteenth Line	
BBQ Grill/ Fireplace		Manhole Storm Sewer		Television Tower		Property Line	
Bearing Tree		Manhole Telephone		Test Wells/Bore Holes		Construction Line	
Bench Mark		Manhole Water		Traffic Sign Double Face		ROW Line	
Box Culvert		Merry-Go-Round		Traffic Sign One Post		New ROW Line	
Bridge		Microwave Radio Tower		Traffic Sign Two Post		Cut and Fill Limits	
Brush/Hedge		Miscellaneous Line		Traffic Signal		Control of Access	
Buildings		Miscellaneous Property Corner		Trash Barrel		New Control of Access	
Bulk Tank		Miscellaneous Post		Tree Belt		Proposed ROW	
Cattle Guard		Overhang Or Encroachment		Tree Coniferous		Remove Concrete Pavement	
Cemetery		Overhead Utility Line		Tree Deciduous		Remove Concrete Driveway Pavement	
Centerline		Parking Meter		Tree Stumps		Remove Asphalt Concrete Pavement	
Cistern		Pedestrian Push Button Pole		Triangulation Station		Remove Concrete Sidewalk	
Clothes Line		Pipe With End Section		Underground Electric Line		Remove Concrete Median Pavement	
Concrete Symbol		Pipe With Headwall		Underground Gas Line		Remove Concrete Curb and/or Gutter	
Control Point		Pipe Without End Section		Underground High Pressure Gas Line		Drainage Arrow	
Creek Edge		Playground Slide		Underground Sanitary Sewer		Remove Concrete Pavement	
Curb/Gutter		Playground Swing		Underground Storm Sewer		Remove Concrete Driveway Pavement	
Curb		Power And Light Pole		Underground Tank		Remove Asphalt Concrete Pavement	
Dam Grade/Dike/Levee		Power And Telephone Pole		Underground Telephone Line		Remove Concrete Sidewalk	
Deck Edge		Power Meter		Underground Television Cable		Remove Concrete Median Pavement	
Ditch Block		Power Pole		Underground Water Line		Remove Concrete Curb and/or Gutter	
Doorway Threshold		Power Pole And Transformer		Water Fountain		Detectable Warning	
Drainage Profile		Power Tower Structure		Water Hydrant		Pedestrian Push Button Pole	
Drop Inlet		Propane Tank		Water Meter		and 30" x 48" Clear Space	
Edge Of Asphalt		Property Pipe		Water Tower		with 1.5% slope	
Edge Of Concrete		Property Pipe With Cap		Water Valve			
Edge Of Gravel		Property Stone		Water Well			
Edge Of Other		Public Telephone		Weir Rock			
Edge Of Shoulder		Railroad Crossing Signal		Windmill			
Electric Transformer/Power Junction Box		Railroad Milepost Marker		Wingwall			
Fence Barbwire		Railroad Profile		Witness Corner			
Fence Chainlink		Railroad ROW Marker					
Fence Electric		Railroad Signs					
Fence Miscellaneous		Railroad Switch					
Fence Rock		Railroad Track					
Fence Snow		Railroad Trestle					
Fence Wood		Rebar					
Fence Woven		Rebar With Cap					
Fire Hydrant		Reference Mark					
Flag Pole		Retaining Wall					
Flower Bed		Riprap					
Gas Valve Or Meter		River Edge					
Gas Pump Island		Rock And Wire Baskets					
Grain Bin		Rockpiles					
Guardrail		Satellite Dish					
Gutter		Septic Tank					
Guy Pole		Shrub Tree					
Haystack		Sidewalk					
Highway ROW Marker		Sign Face					
Interstate Close Gate		Sign Post					
Iron Pin		Slough Or Marsh					
Irrigation Ditch		Spring					
Lake Edge		Stream Gauge					
Lawn Sprinkler		Street Marker					

Plotting Date: 5/22/2024 Rev 5/22/24 EJV

84+67 - 79' R to 85+84 - 159' R  
Remove 147' of Existing 24" CMP  
and 2 End Sections  
(Incidental Work, Grading)

84+49-71' R to 86+69-170' R  
Install 30"-276' of CMP (22' & 190' & 64')  
1-10° Elbow  
1-12.5° Elbow  
2-CMP Flared Ends

86+74  
Bore & Jack 30"-272' Steel Pipe  
Skewed 7° RHF  
& 2-CMP Flared Ends

87+02 - 172' R  
Install Class B Riprap  
(15.6 Ton - See Riprap Detail for Site 1)  
Install Type B Drainage Fabric  
(25.3 Sq Yd)

84+66 R  
Install Ditch Block (296 CY)

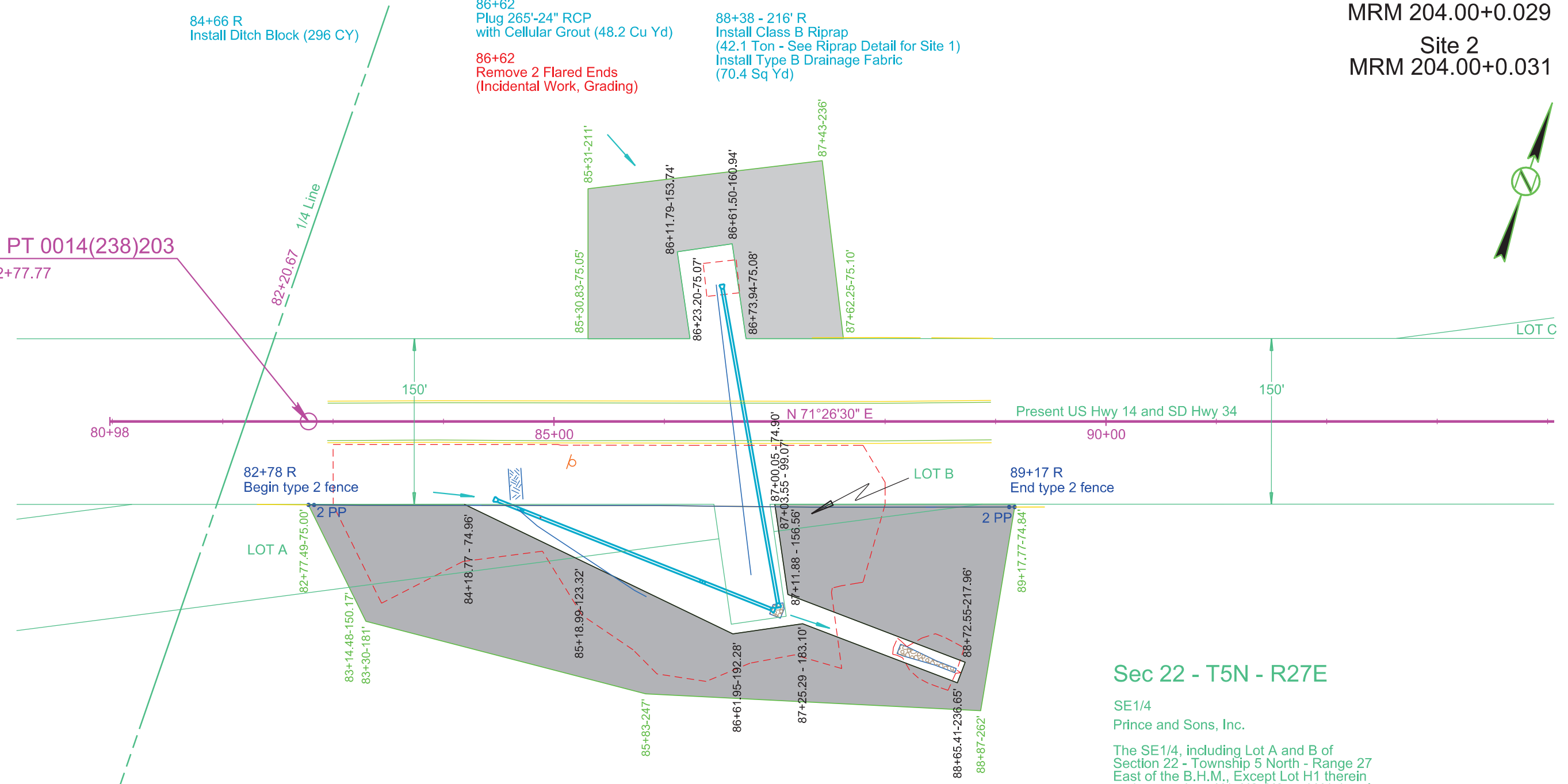
86+62  
Plug 265'-24" RCP  
with Cellular Grout (48.2 Cu Yd)

88+38 - 216' R  
Install Class B Riprap  
(42.1 Ton - See Riprap Detail for Site 1)  
Install Type B Drainage Fabric  
(70.4 Sq Yd)

86+62  
Remove 2 Flared Ends  
(Incidental Work, Grading)

Site 1  
MRM 204.00+0.029  
Site 2  
MRM 204.00+0.031

BEGIN PT 0014(238)203  
Station 82+77.77



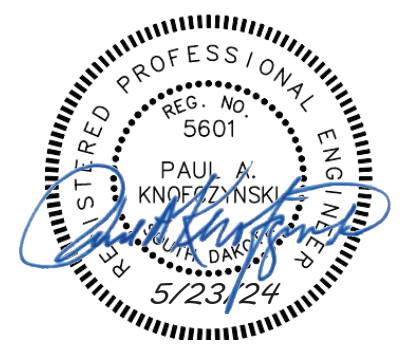
Sec 22 - T5N - R27E

SE1/4  
Prince and Sons, Inc.

The SE1/4, including Lot A and B of  
Section 22 - Township 5 North - Range 27  
East of the B.H.M., Except Lot H1 therein  
and except Lots H1, H2, H3 and H4 therein

Parcel 1  
0.40 ac, R.O.W.  
(17549 sq ft) more or less.

Parcel 1 82+77.49 to 89+17.77 R Temporary Easement containing 1.7 ac, more or less	Parcel 1 85+30.83 to 87+62.25 L Temporary Easement containing 0.7 ac, more or less
---	---



Plot Scale - 1:100,227

Plotted From - evanwolf

**FOR BIDDING PURPOSES ONLY**

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	PT 0014(238)203	29	65

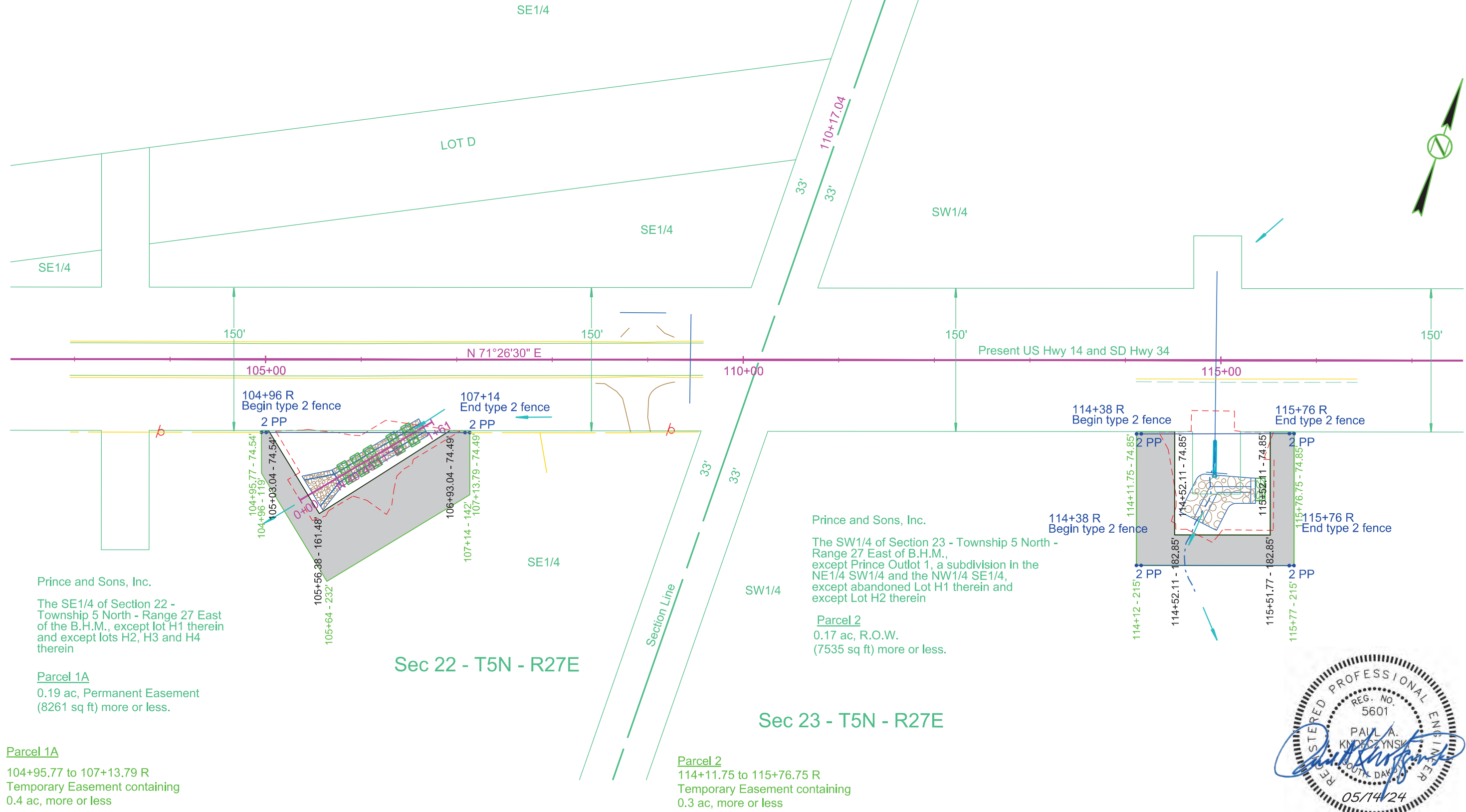
Plotting Date: 5/7/2024

105+85 R  
105+99 R  
106+12 R  
106+36 R  
106+52 R  
115+41 R  
Install Rock Check Dams  
(See Erosion Control Sheets)

106+07 - 105' R  
Install Class B Riprap  
(393.2 Ton - See Riprap Detail for Site 3)  
Install Type B Drainage Fabric (430 Sq Yd)

114+94 - 106' R  
Install Class B Riprap  
(365.5 Ton - See Riprap Detail for Site 4)  
Install Type B Drainage Fabric (377.1 Sq Yd)

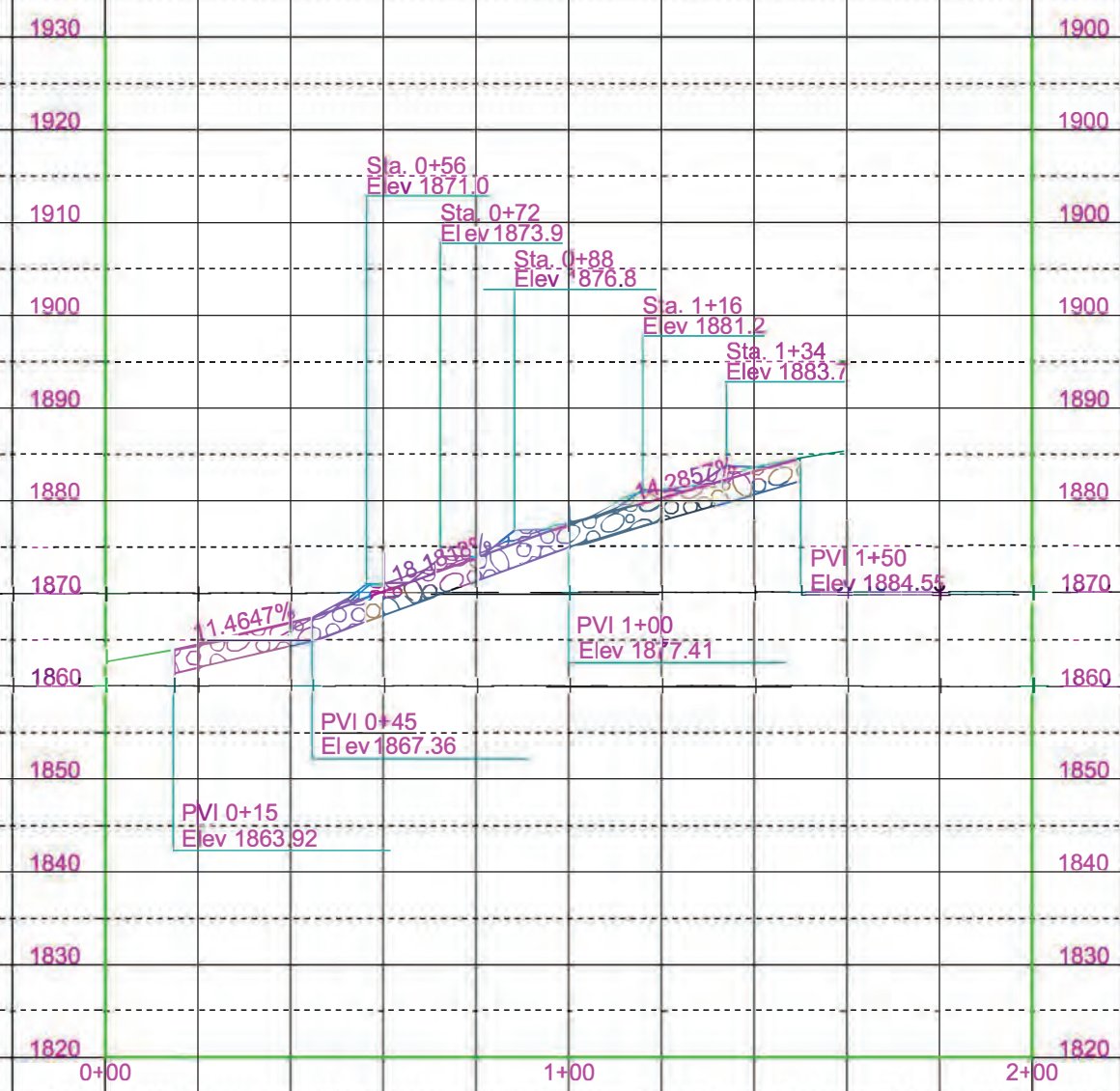
Site 3  
MRM 204.00+0.400  
Site 4  
MRM 204.00+0.570



File - ...Plans\Sections\plan101.dgn

Plot Scale: 1"=40'

# Check Dam Profile (Site 3)



Plotted From: e:\exam\wf

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Plotting Date: 5/16/2024  
 Rev. 5-16-24 pk

**FOR BIDDING PURPOSES ONLY**

145+60  
 Cleanout Joints for Joint Sealing (204 Ft)  
 145+60  
 Repair Culvert Joints (204 Ft)  
 145+56 R  
 Adjust Fence Panels for Access  
 (Incidental Work, Grading)

1+11 151'R  
 1+31 155'R  
 1+51 160'R  
 1+72 165'R  
 2+20 172'R  
 2+46 178'R  
 2+96 180'R  
 3+35 184'R  
 Install Rock Check Dams  
 (See Erosion Control Sheets)

153+97 - 196' R  
 Remove and Reset End Section  
 153+97 - 196' R  
 Reprofile Ditch to Establish Flow  
 (0.5 Sta)

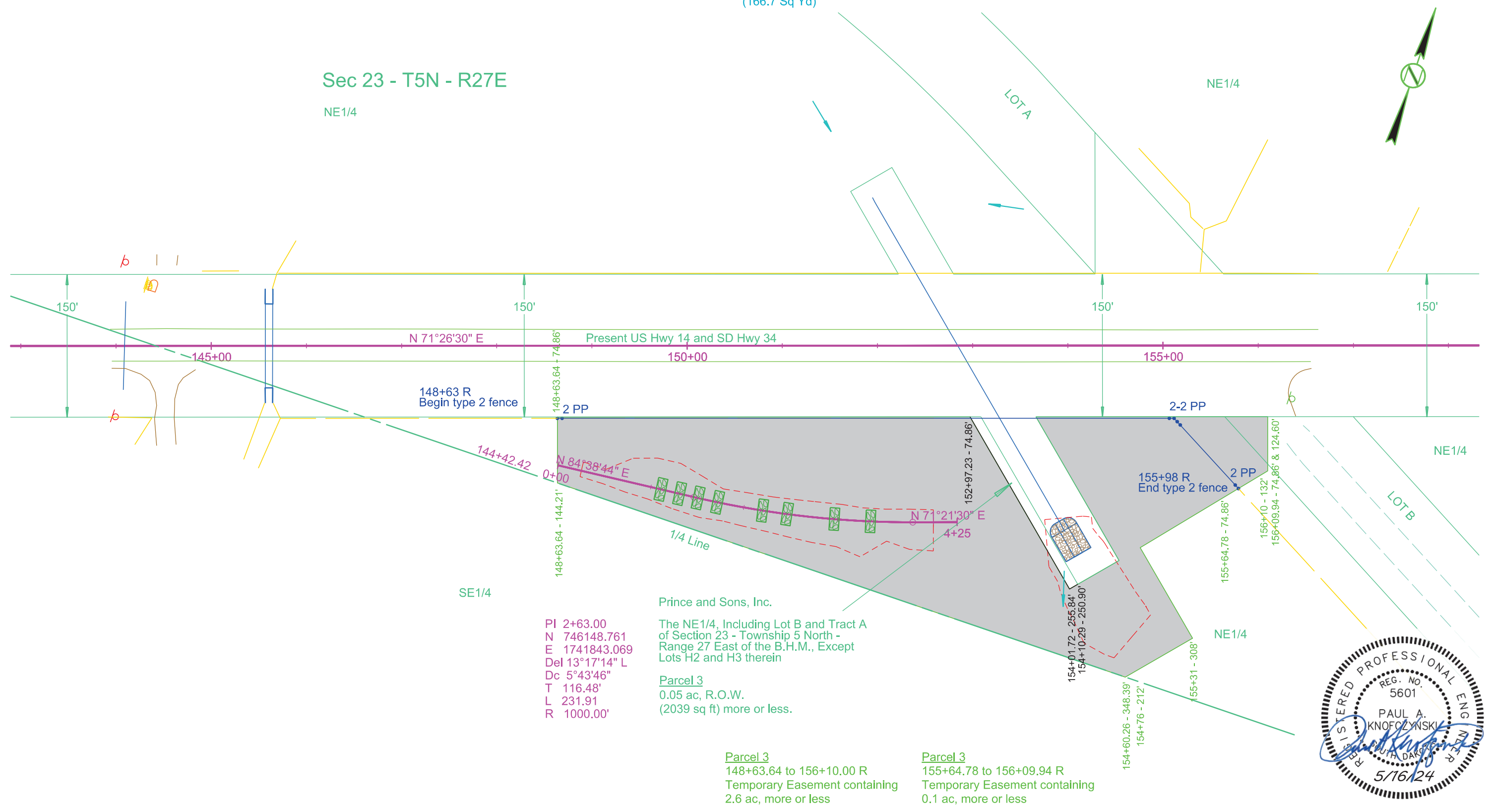
153+97 - 196' R  
 Install Class B Riprap  
 (151.6 Ton - See Riprap Detail for Site 6)  
 Install Type B Drainage Fabric  
 (166.7 Sq Yd)

154+50 ±  
 Located Buried Pipe  
 (Incidental Work, Grading)

Site 5  
 MRM 205.00+0.152

Site 6  
 MRM 205.00+0.310

Sec 23 - T5N - R27E  
 NE1/4



PI 2+63.00  
 N 746148.761  
 E 1741843.069  
 Del 13°17'14" L  
 Dc 5°43'46"  
 T 116.48'  
 L 231.91  
 R 1000.00'

Prince and Sons, Inc.  
 The NE1/4, Including Lot B and Tract A  
 of Section 23 - Township 5 North -  
 Range 27 East of the B.H.M., Except  
 Lots H2 and H3 therein

Parcel 3  
 0.05 ac, R.O.W.  
 (2039 sq ft) more or less.

Parcel 3  
 148+63.64 to 156+10.00 R  
 Temporary Easement containing  
 2.6 ac, more or less

Parcel 3  
 155+64.78 to 156+09.94 R  
 Temporary Easement containing  
 0.1 ac, more or less



FOR BIDDING PURPOSES ONLY



STATE OF SOUTH DAKOTA

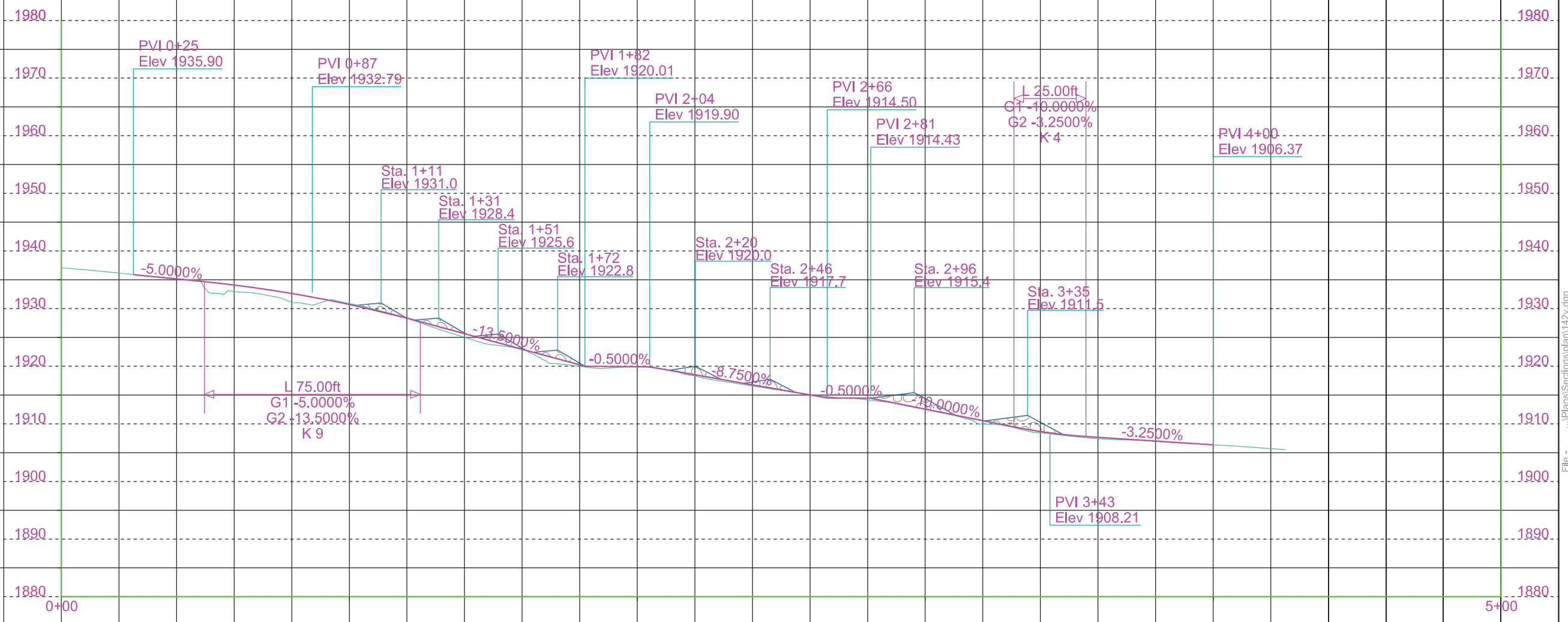
PROJECT  
PT 0014(238)203

SHEET  
32

TOTAL SHEETS  
65

Plotting Date: 4/8/2024

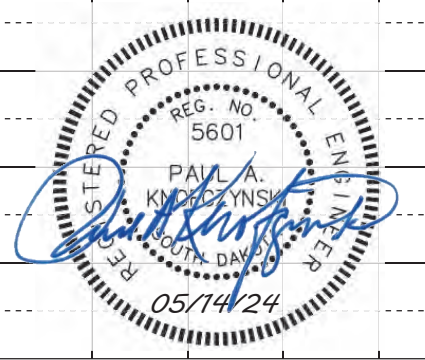
# Embankment Repair Profile (Site 5)



Plot Scale - 1:40

Plotted From - evanwolf

File - ...Plans\Sections\plan142v.dgn





Plot Scale - 1:100

Plotted From - evenwolf

170+75 - 51' L to 172+27' -80' L  
Remove 155' of Existing 36" CMP  
and 2 end Sections  
(Incidental Work, Grading)

170+78-51' L to 173+35-133' L  
Install 36"-270' of CMP (138' & 88' & 44')  
1-7.5° Elbow  
1-10.0° Elbow  
2-CMP Flared Ends

173+60 - 138' L  
Install Class B Riprap  
(313.6 Ton - See Riprap Detail for Site 7)  
Install Type B Drainage Fabric  
(328.8 Sq Yd)

176+61 - 178' L  
Install Class B Riprap  
(84.3 Ton - See Riprap Detail for Site 7)  
Install Type B Drainage Fabric  
(100.8 SqYd)

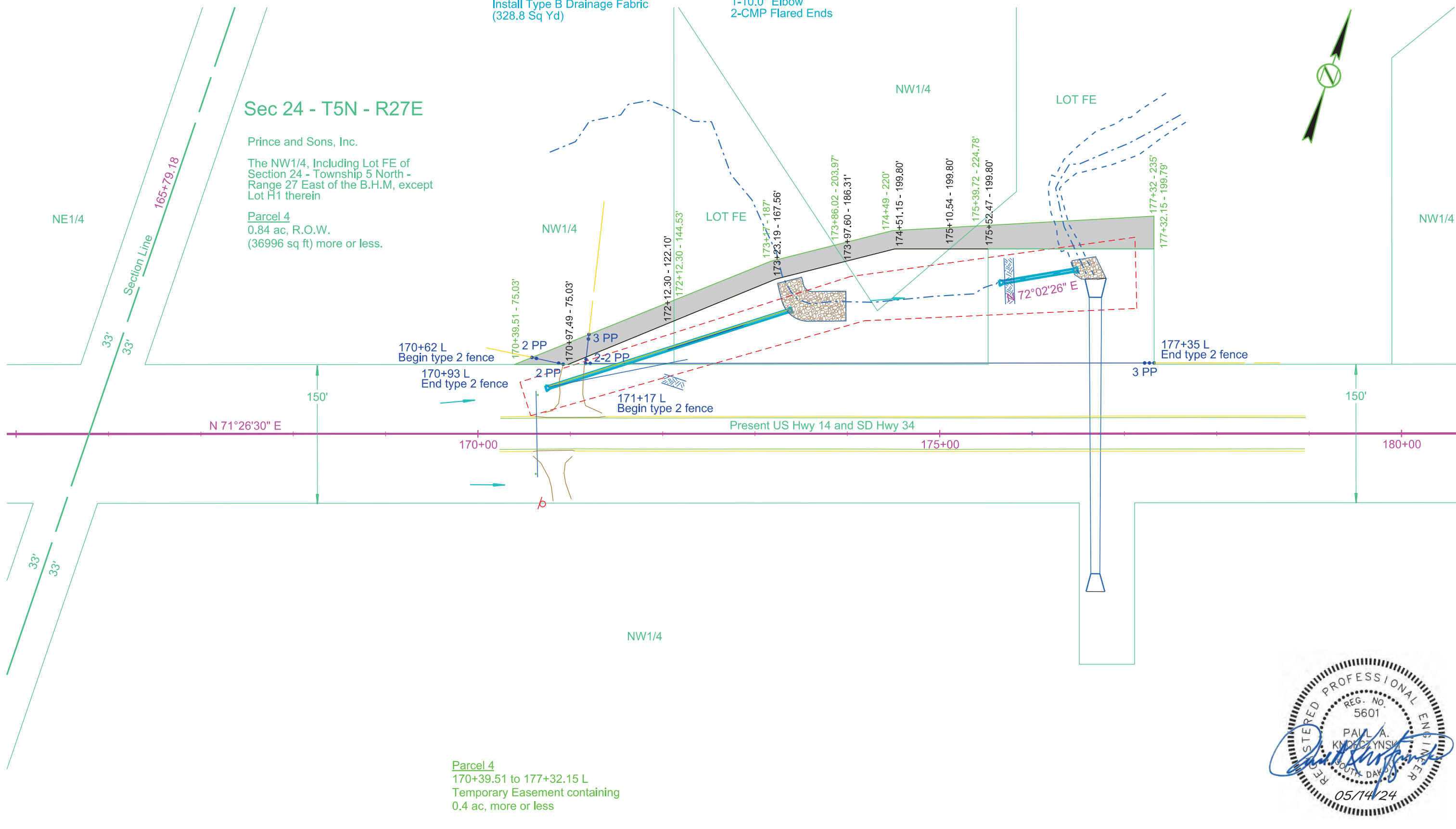
175+69-164' L to 176+45-177' L  
Install 36"-72 of CMP (20' & 36' & 16')  
1-7.5° Elbow  
1-10.0° Elbow  
2-CMP Flared Ends

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	PT 0014(238)203	33	65

Plotting Date: 5/13/2024

Site 7  
MRM 205.00+0.730



Parcel 4  
170+39.51 to 177+32.15 L  
Temporary Easement containing  
0.4 ac, more or less



File - ...Plans\Sections\plan1465.dgn

Plot Scale - 1:100

Plotted From - evanwolf

FOR BIDDING PURPOSES ONLY

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	PT 0014(238)203	34	65

Plotting Date: 5/13/2024

187+13 - 73' R  
 Remove 16' of Existing 24" RCP  
 & 1 Flared End Section  
 (Incidental Work, Grading)

187+16 - 101' R  
 Install Class B Riprap  
 (19.1 Ton - See Riprap Detail for Site 8)  
 Install Type B Drainage Fabric  
 (29.9 Sq Yd)

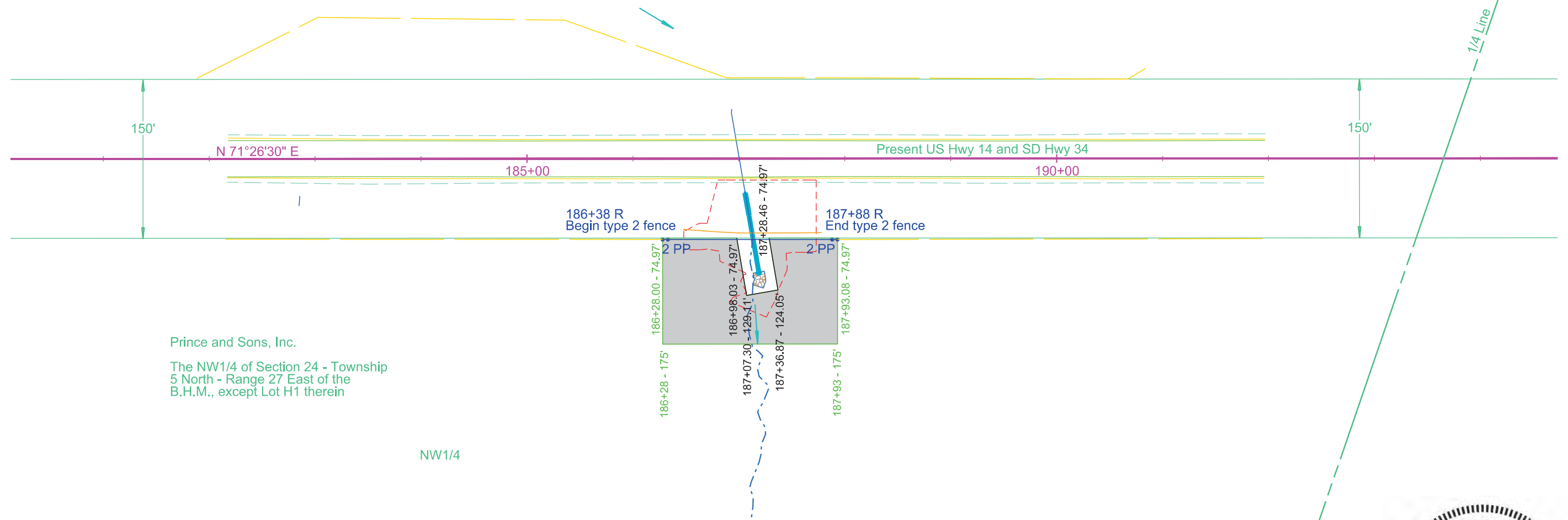
187+06-29' R to 187+18-105' R  
 Install 24" - 20' RCP  
 24"-48' CMP (20' & 28')  
 Skewed 10° RHF  
 2-17.5° Elbows  
 1-RCP to CMP Outlet Transtion  
 1-CMP Flared End

187+13 - R  
 Install Fence Berm

Site 8  
 MRM 205.00+0.937

Sec 24 - T5N - R27E

NW1/4



Prince and Sons, Inc.  
 The NW1/4 of Section 24 - Township  
 5 North - Range 27 East of the  
 B.H.M., except Lot H1 therein

NW1/4

Parcel 4A  
 186+28.00 to 187+93.08 R  
 Temporary Easement containing  
 0.3 ac, more or less



File - ...Plans\Sections\plan180.dgn

Plot Scale - 1:100

Plotted From - evenwolf

202+24 - 94' R  
Remove 44' of Existing Culvert  
(Incidental Work, Grading)

202+24-94' R to 202+11-140' R  
Install 42"-8' RCP  
42"-40' CMP (20' & 20')  
Skewed 16° LHF  
1-RCP to CMP Transition  
2-27.5° Elbows  
1-CMP Flared End

201+72 - 193' R  
Install Class B Riprap  
(123.1 Ton - See Riprap Detail for Site 9)  
Install Type B Drainage Fabric  
(156.1 SqYd)

210+19 - 77' R to 210+24 - 62' R  
Remove 15' of Existing 36" RCP  
& 1 Flared End Section  
(Incidental Work, Grading)

209+99-103' R to 210+25-62' R  
Install 36"-44' CMP  
Skewed 40° LHF  
1-20° Elbow  
1-CMP Flared End

210+22 R  
Install Fence Berm

FOR BIDDING PURPOSES ONLY

210+24 - 85' R to 210+69 - 60' R  
Remove 52' of Existing 30" RCP  
& 2 Flared End Sections  
(Incidental Work, Grading)

210+09-109' R to 210+72-60' R  
Install 30"-76' CMP (36' & 30' & 10')  
1-15.0° Elbow  
1-12.5° Elbow  
2-CMP Flared Ends

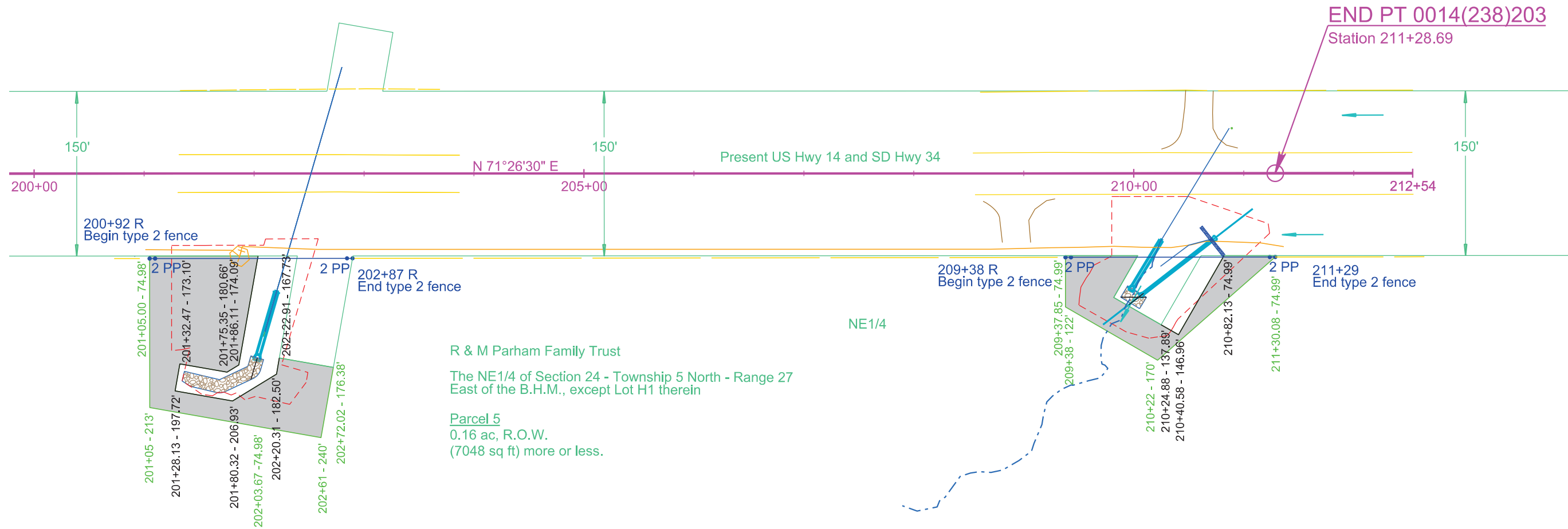
210+00 - 113' R  
Install Class B Riprap  
(31.1 Ton - See Riprap Detail for Site 10)  
Install Type B Drainage Fabric  
(44.4 SqYd)

210+61 - 49' R to 210+82 - 75' R  
Install Ditch Block  
(11 CuYd)

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	PT 0014(238)203	35	65

Plotting Date: 5/13/2024

Site 9  
MRM 206.00+0.208  
Site 10  
MRM 206.00+0.335



R & M Parham Family Trust  
The NE1/4 of Section 24 - Township 5 North - Range 27  
East of the B.H.M., except Lot H1 therein

Parcel 5  
0.16 ac, R.O.W.  
(7048 sq ft) more or less.

Sec 24 - T5N - R27E

Parcel 5  
201+05.00 to 202+72.02 R  
Temporary Easement containing  
0.4 ac, more or less

Parcel 5  
209+37.85 to 211+30.08 R  
Temporary Easement containing  
0.2 ac, more or less



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# RIPRAP DETAILS

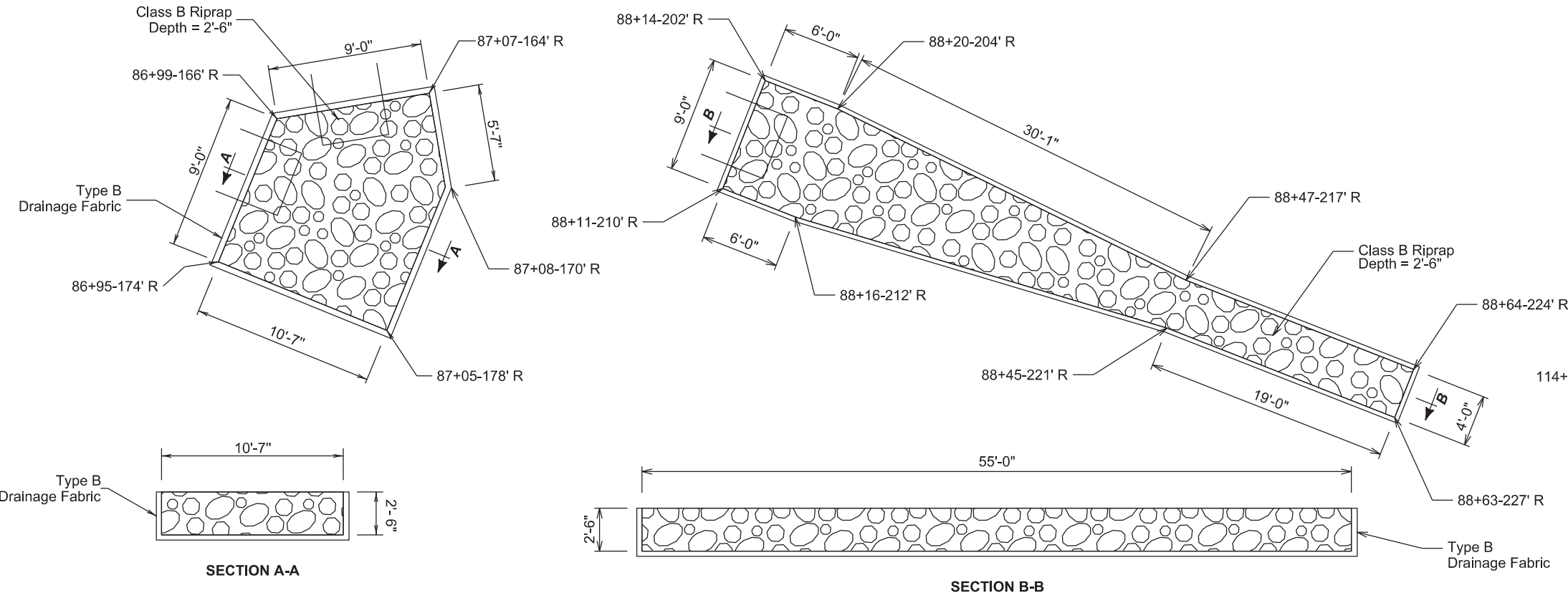
FOR BIDDING PURPOSES ONLY

KLJ STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	PT 0014(238)203	36	65

Plotting Date: 5/7/2024

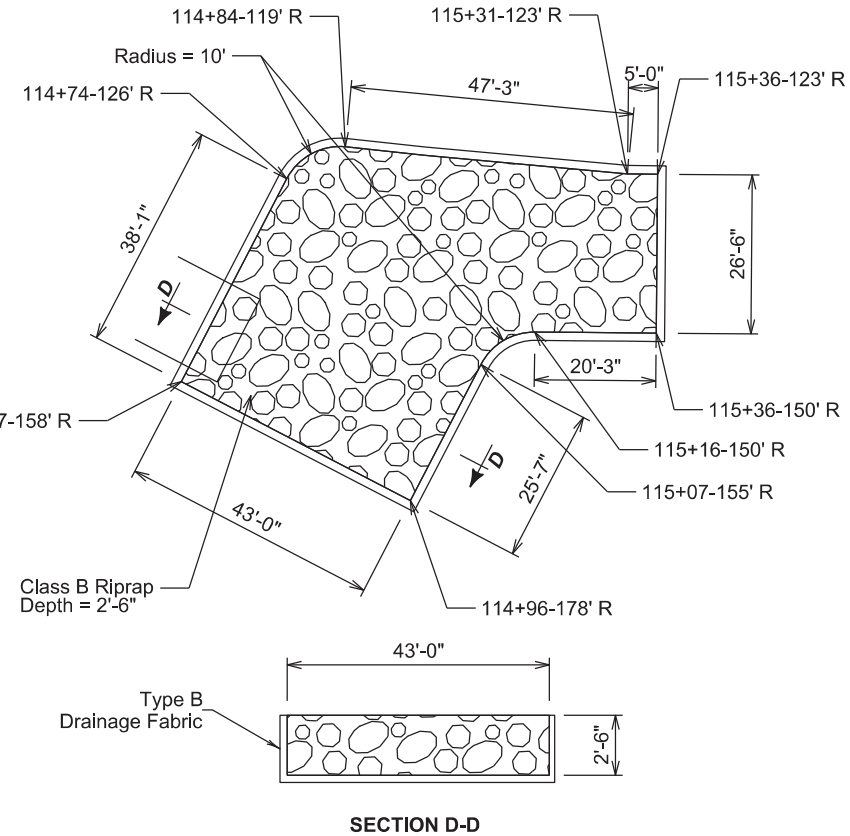
PLAN VIEW

Site 1  
MRM 204.00+0.031



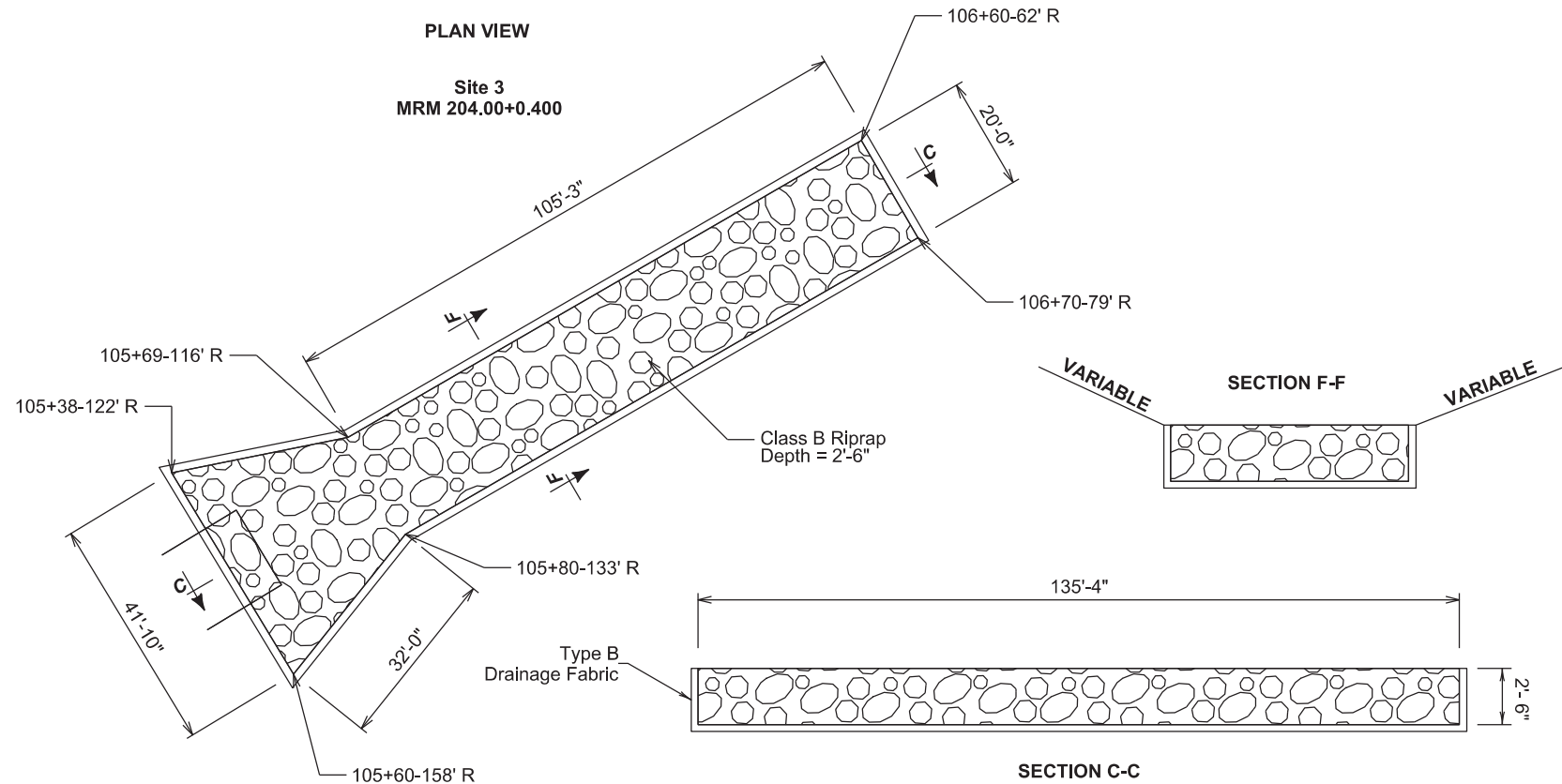
PLAN VIEW

Site 4  
MRM 204.00+0.570



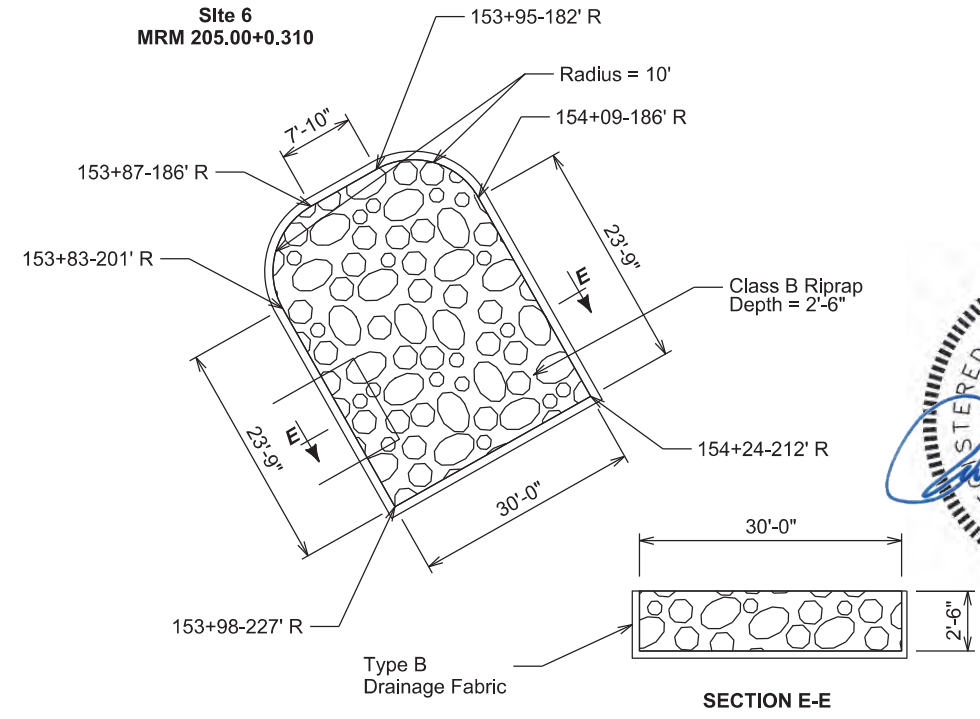
PLAN VIEW

Site 3  
MRM 204.00+0.400



PLAN VIEW

Site 6  
MRM 205.00+0.310



Plot Scale - 1:20  
Plotted From - evanwolf  
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# RIPRAP DETAILS

FOR BIDDING PURPOSES ONLY

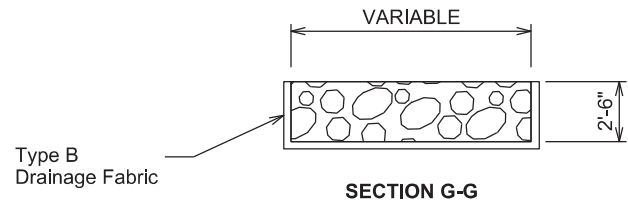
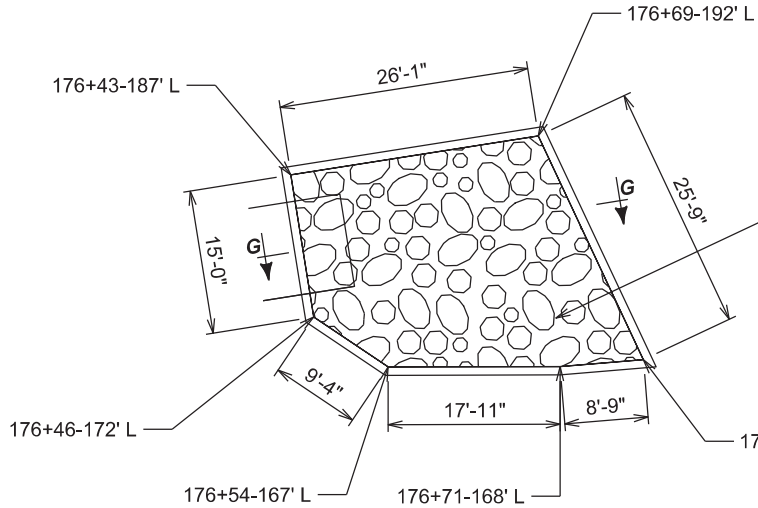
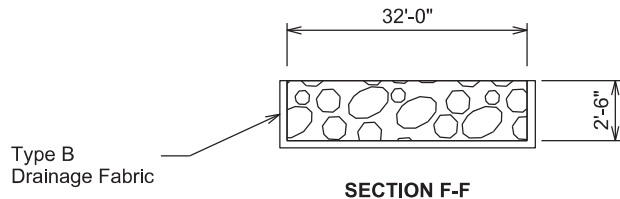
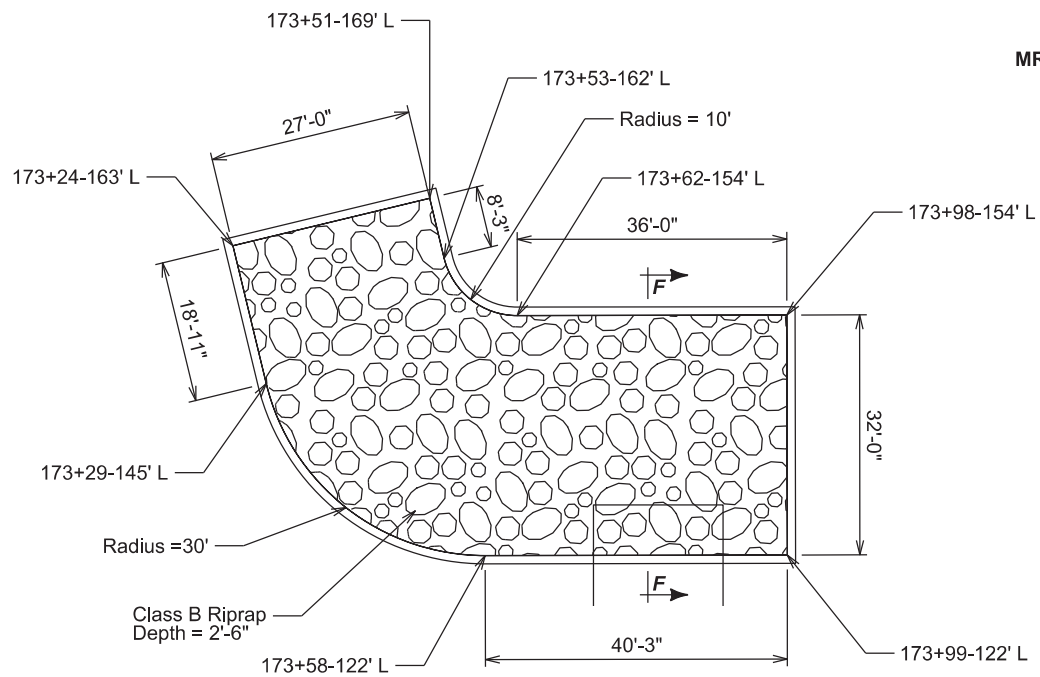
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	PT 0014(238)203	37	65

Plotting Date: 5/7/2024

Plot Scale - 1:20

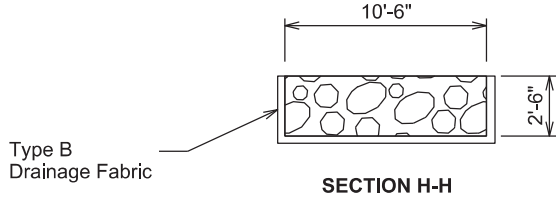
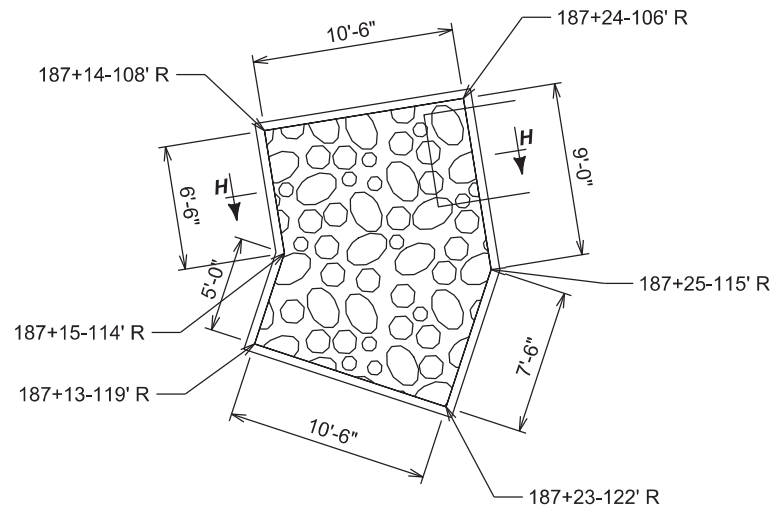
### PLAN VIEW

Site 7  
MRM 205.00+0.730



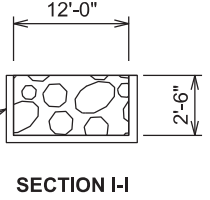
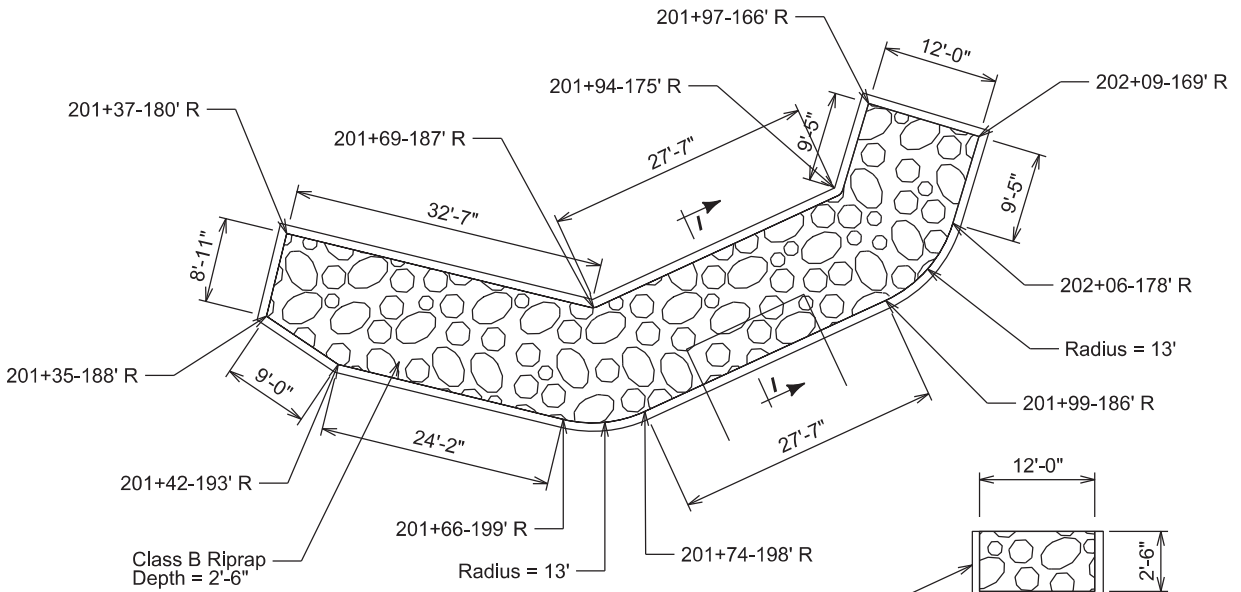
### PLAN VIEW

Site 8  
MRM 205.00+0.937



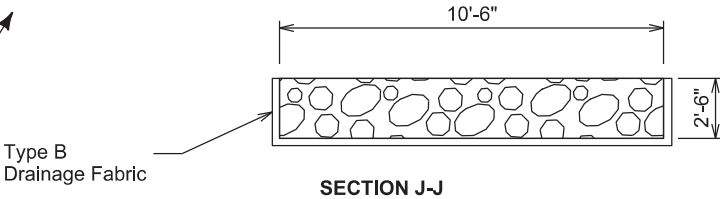
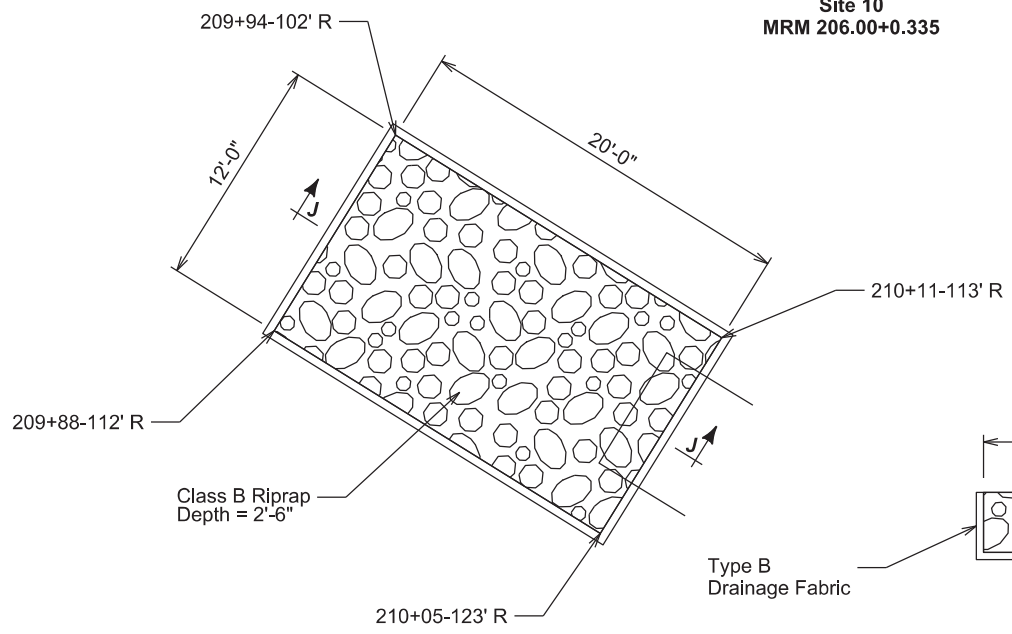
### PLAN VIEW

Site 9  
MRM 206.00+0.208



### PLAN VIEW

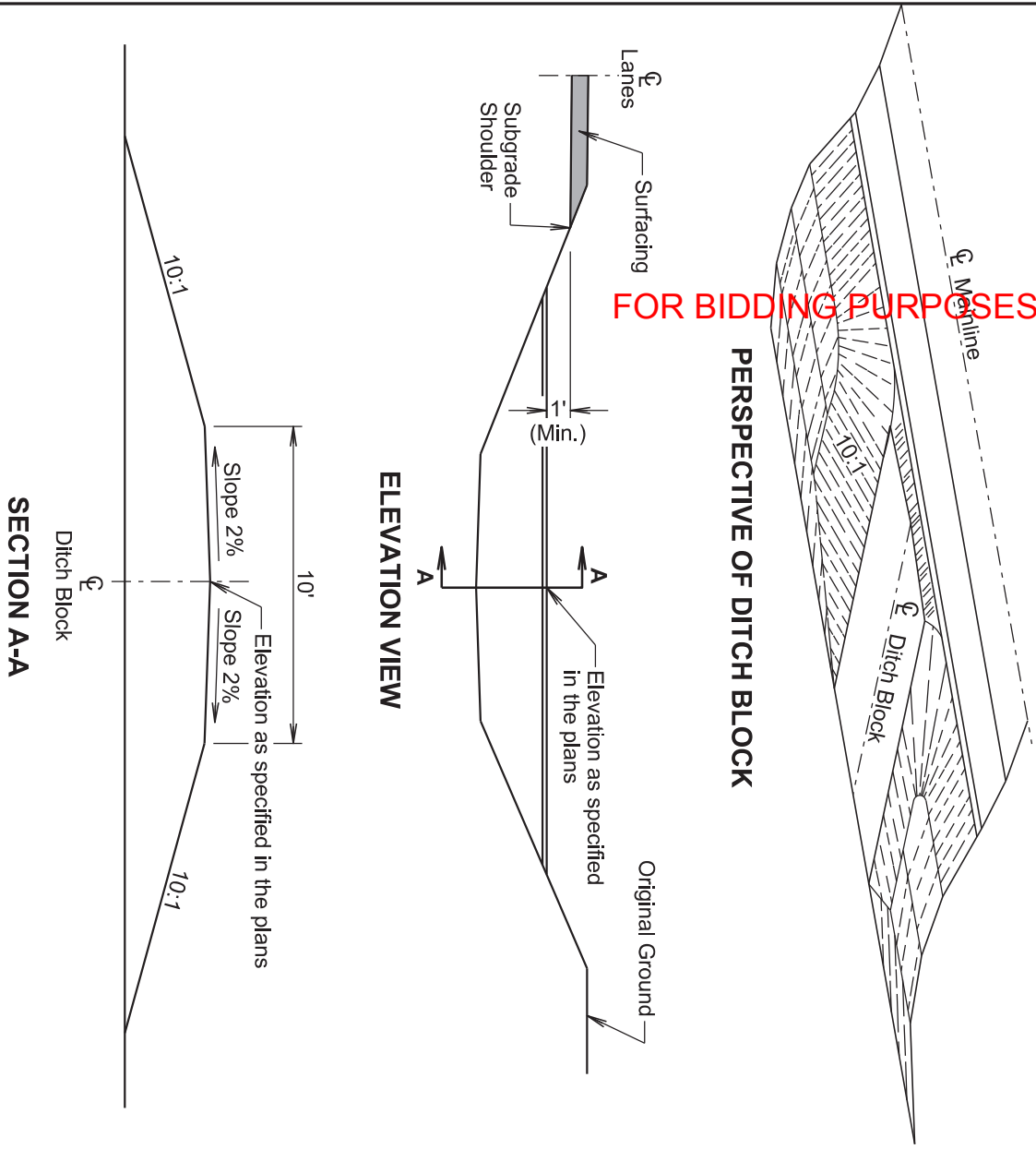
Site 10  
MRM 206.00+0.335



Plotted From - evanwolf

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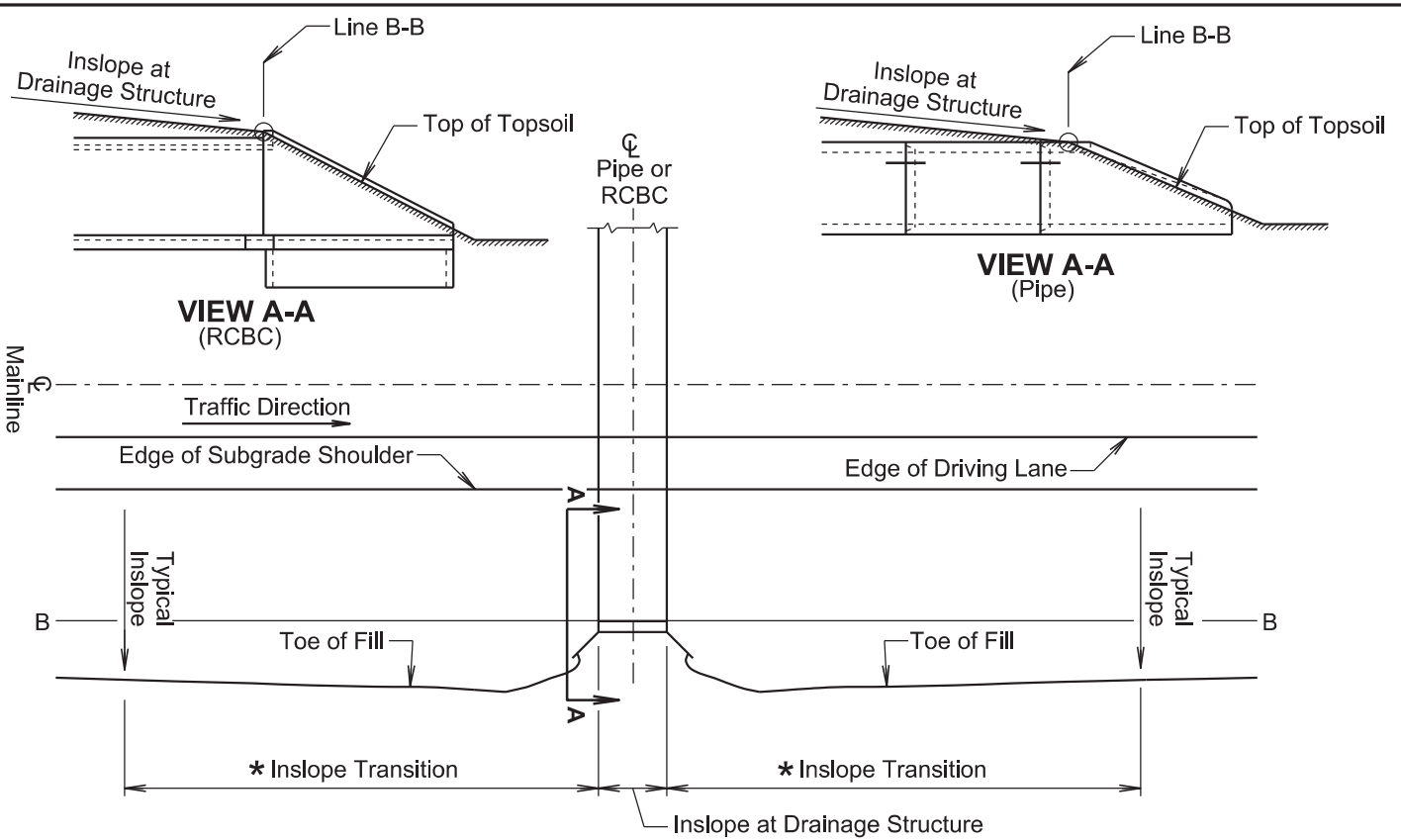
FOR BIDDING PURPOSES ONLY



**GENERAL NOTES:**

The ditch section shown above in the perspective and elevation view is only for illustrative purpose.  
 The inslopes of the ditch block will be 10:1 or as specified in the plans.  
 The transition area between the mainline inslope and the ditch block inslope will be rounded to eliminate an abrupt transition.

Published Date: 2024	S D D O T	DITCH BLOCK	September 14, 2018
		PLATE NUMBER 120.02	
		Sheet 1 of 1	



**TYPE 1 INSLOPE TRANSITION**

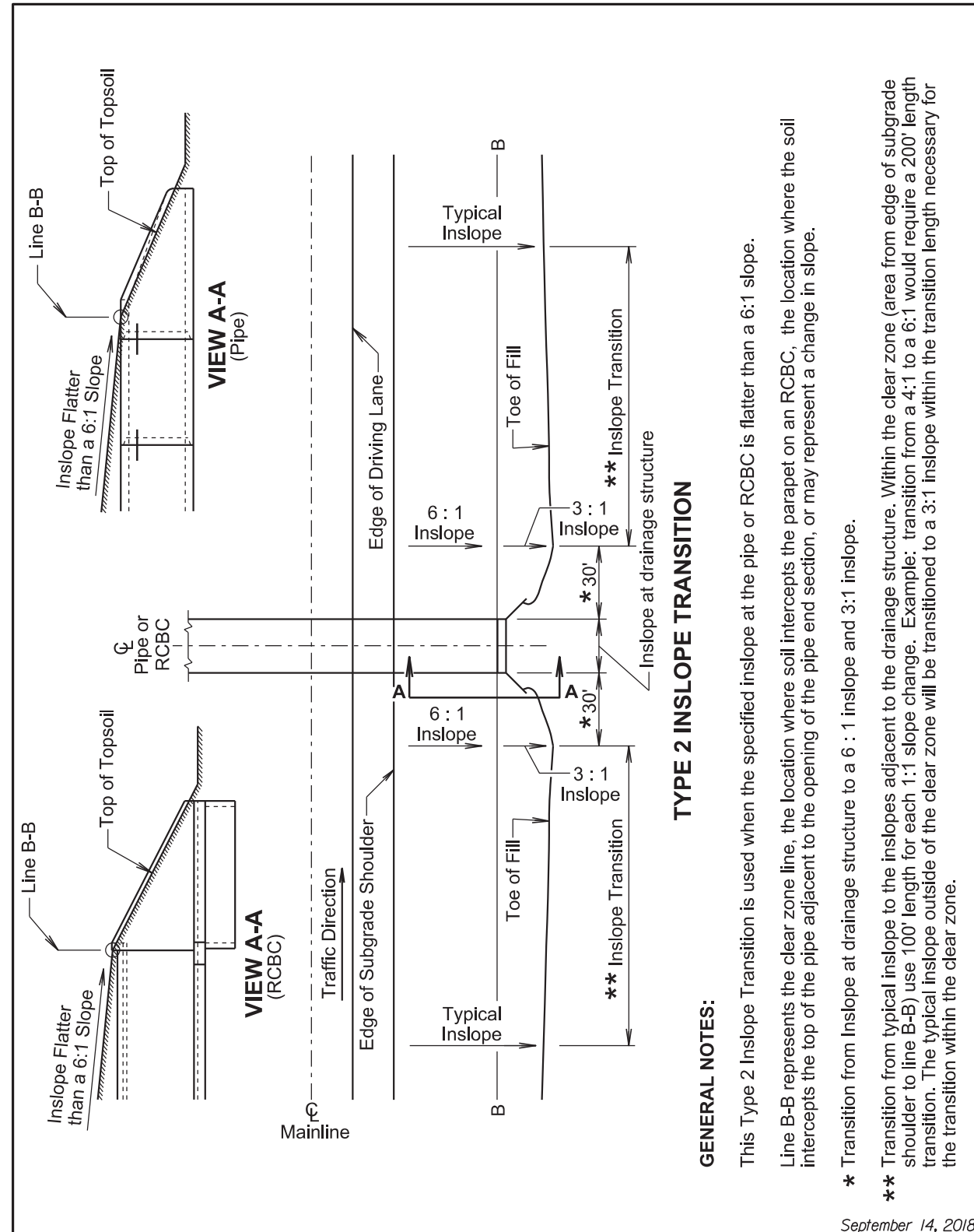
**GENERAL NOTES:**

This Type 1 Inslope Transition is used when the specified inslope at the drainage structure is flatter than the typical inslope and the inslope at the drainage structure is between a 4:1 slope and 6:1 slope.

Line B-B represents the clear zone line, the location where soil intercepts the parapet on an RCBC, the location where the soil intercepts the top of the pipe adjacent to the opening of the pipe end section, or may represent a change in slope.

\* Transition from the typical inslope to the inslope at the drainage structure. Within the clear zone (area from edge of subgrade shoulder to line B-B) use 100' length for each 1:1 slope change. Example: transition from a 4:1 to a 6:1 would require a 200' length transition. The typical inslope outside of the clear zone will be transitioned gradually to the slope necessary adjacent to the RCBC wing wall or pipe culvert end section within the transition length necessary for the transition within the clear zone.

Published Date: 2024	S D D O T	INSLOPE TRANSITIONS AT PIPE CULVERTS OR REINFORCED CONCRETE BOX CULVERTS	September 14, 2018
		PLATE NUMBER 120.05	
		Sheet 1 of 2	



**TYPE 2 INSLOPE TRANSITION**

**GENERAL NOTES:**

This Type 2 Inslope Transition is used when the specified inslope at the pipe or RCBC is flatter than a 6:1 slope.

Line B-B represents the clear zone line, the location where soil intercepts the parapet on an RCBC, the location where the soil intercepts the top of the pipe adjacent to the opening of the pipe end section, or may represent a change in slope.

\* Transition from Inslope at drainage structure to a 6 : 1 inslope and 3:1 inslope.

\*\* Transition from typical inslope to the inslopes adjacent to the drainage structure. Within the clear zone (area from edge of subgrade shoulder to line B-B) use 100' length for each 1:1 slope change. Example: transition from a 4:1 to a 6:1 would require a 200' length transition. The typical inslope outside of the clear zone will be transitioned to a 3:1 inslope within the transition length necessary for the transition within the clear zone.

September 14, 2018

Published Date: 2024

SDDOT

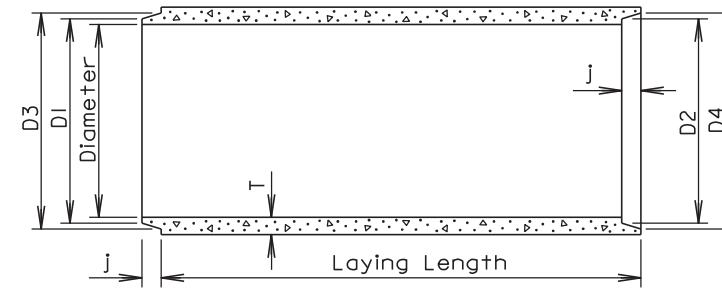
**INSLOPE TRANSITIONS AT PIPE CULVERTS  
OR REINFORCED CONCRETE BOX CULVERTS**

PLATE NUMBER  
120.05

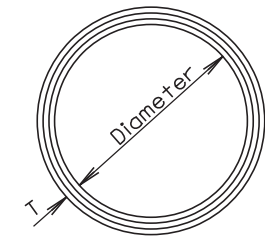
Sheet 2 of 2

**TOLERANCES IN DIMENSIONS**

Diameter: ±1.5% for 24" Dia. or less and ±1% or 3/8" whichever is more for 27" Dia. or greater.  
 Diameters at joints: ± 3/16" for 30" Dia. or less and ± 1/4" for 36" or greater.  
 Length of joint (j): ± 1/4".  
 Wall thickness (T): not less than design T by more than 5% or 3/16", whichever is greater.  
 Laying length: shall not underrun by more than 1/2".



LONGITUDINAL SECTION



END VIEW

**GENERAL NOTES:**

Construction of R. C. P. shall conform to the requirements of Section 990 of the Specifications.

Not more than 2 four-foot sections shall be permitted near the ends of any culvert. Four-foot lengths shall be used only to secure the required length of culvert.

Diam. (in.)	Approx. Wt. /Ft. (lb.)	T (in.)	J (in.)	D1 (in.)	D2 (in.)	D3 (in.)	D4 (in.)
12	92	2	1 3/4	13 1/4	13 5/8	13 7/8	14 1/4
15	127	2 1/4	2	16 1/2	16 7/8	17 1/4	17 5/8
18	168	2 1/2	2 1/4	19 5/8	20	20 3/8	20 3/4
21	214	2 3/4	2 1/2	22 7/8	23 1/4	23 3/4	24 1/8
24	265	3	2 3/4	26	26 3/8	27	27 3/8
27	322	3 1/4	3	29 1/4	29 5/8	30 1/4	30 5/8
30	384	3 1/2	3 1/4	32 3/8	32 3/4	33 1/2	33 3/8
36	524	4	3 3/4	38 3/4	39 1/4	40	40 1/2
42	685	4 1/2	4	45 1/8	45 5/8	46 1/2	47
48	867	5	4 1/2	51 1/2	52	53	53 1/2
54	1070	5 1/2	4 1/2	57 7/8	58 3/8	59 3/8	59 3/8
60	1296	6	5	64 1/4	64 3/4	66	66 1/2
66	1542	6 1/2	5 1/2	70 5/8	71 1/8	72 1/2	73
72	1810	7	6	77	77 1/2	79	79 1/2
78	2098	7 1/2	6 1/2	83 3/8	83 7/8	85 5/8	86 1/8
84	2410	8	7	89 3/4	90 1/4	92 1/8	92 5/8
90	2740	8 1/2	7	95 3/4	96 1/4	98 1/8	98 5/8
96	2950	9	7	102 1/8	102 5/8	104 1/2	105
102	3075	9 1/2	7 1/2	109	109 1/2	111 1/2	112
108	3870	10	7 1/2	115 1/2	116	118	118 1/2

June 26, 2015

Published Date: 2024

SDDOT

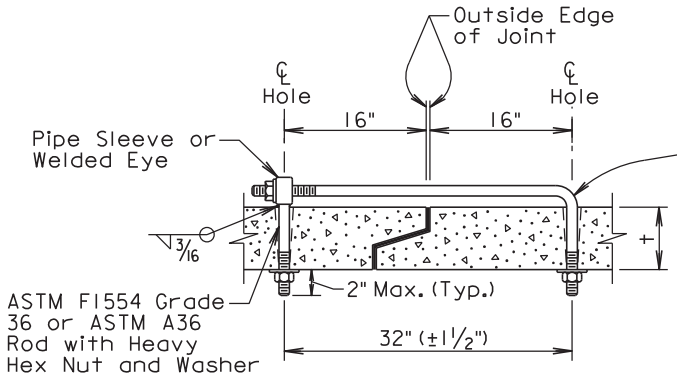
**REINFORCED CONCRETE PIPE**

PLATE NUMBER  
450.01

Sheet 1 of 1

Wall "t" (in.)	Rod Dia. (in.)	Pipe Sleeve Dia. (nominal)
≤ 3/4	5/8	3/4
3/2-6/2	3/4	1
≥ 7	1	1 1/4

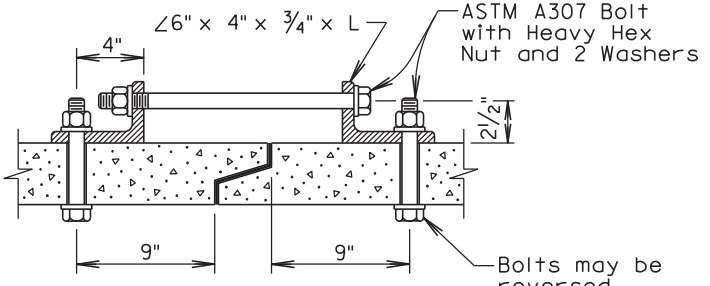
**GENERAL NOTES:**  
 Tie bolts shall conform to ASTM F1554 Grade 36 or ASTM A36. Nuts shall be heavy hex conforming to ASTM A563. Washers shall conform to ASTM F436.  
 Pipe Sleeve shall conform to ASTM A500 or A53, Grade B.  
 Galvanize adjustable eye bolt tie assembly in accordance with ASTM A153.



**ADJUSTABLE EYE BOLT TIE**

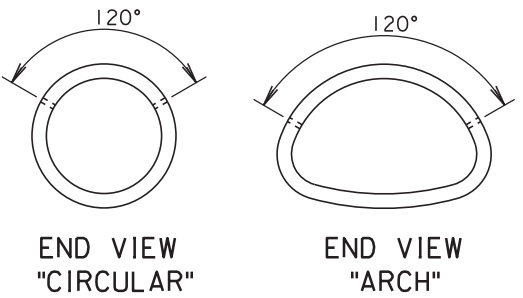
Pipe Dia. (in.)	"L" (in.)	Bolt Dia. (in.)
≤ 48	4	3/4
> 48	6	1

**GENERAL NOTES:**  
 Angles shall conform to ASTM A36.  
 Bolts shall conform to ASTM A307. Nuts shall be heavy hex conforming to ASTM A563. Washers shall conform to ASTM F436.  
 Galvanize angles, bolts, nuts, and washers in accordance with ASTM A153.



**ANGLE AND BOLT TIE**

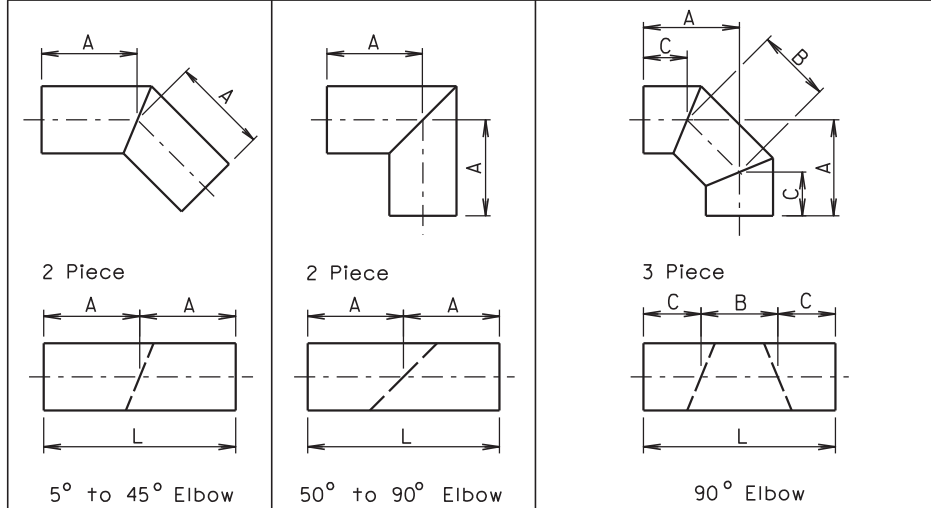
**GENERAL NOTES:**  
 In lieu of the tie bolts detailed above other types of tie bolt connections may be installed as approved by the Office of Bridge Design.  
 All pipe sections of R.C.P. and R.C.P. Arch shall be tied with tie bolts except for pipe located between drop inlets, manholes, and junction boxes. All pipe sections of pipes that only enter or exit drop inlets, manhole, and junction boxes shall be tied with tie bolts.  
 There will be no separate measurement or payment for the tie bolts. The cost for furnishing and installing the tie bolts shall be incidental to the contract unit price per foot for the corresponding bid item for R.C.P. or R.C.P. Arch.



**END VIEW "CIRCULAR"      END VIEW "ARCH"**

February 28, 2013

<b>S D D O T</b>	<b>TIE BOLTS FOR R.C.P. AND R.C.P. ARCH</b>	PLATE NUMBER <b>450.18</b>
	Published Date: 2024	Sheet 1 of 1



Diameter	A	L	Diameter	A	L	Diameter	A	B	C	L
Inches	Feet	Feet	Inches	Feet	Feet	Inches	Inches			Feet
12	1	2	12	2	4	12	25 1/2	11	18 1/2	4
15	1	2	15	2	4	15	26 1/2	12	18	4
18	1	2	18	2	4	18	27	14	17	4
21	2	4	21	2	4	21	27	15	16 1/2	4
24	2	4	24	2	4	24	27 1/2	16	16	4
27	2	4	27	2	4	27	27 1/2	17	15 1/2	4
30	2	4	30	3	6	30	40	19	26 1/2	6
33	2	4	33	3	6	33	40	20	26	6
36	2	4	36	3	6	36	40 1/2	21	25 1/2	6
42	2	4	42	3	6	42	41	23	24 1/2	6
48	2	4	48	4	8	48	53 1/2	26	35	8
54	3	6	54	4	8	54	54	28	34	8
60	3	6	60	4	8	60	54 1/2	31	32 1/2	8
66	3	6	66	4	8	66	54	33	31 1/2	8
72	3	6	72	5	10	72	67 1/2	36	42	10
78	3	6	78	5	10	78	68	39	40 1/2	10
84	3	6	84	5	10	84	68 1/2	41	39 1/2	10
90	3	6	90	6	12	90	70	46	37	10
96	3	6	96	6	12	96	82	46	49	12

**FABRICATED ELBOW LENGTHS FOR ALL CORRUGATIONS**

**GENERAL NOTES:**  
 All dimensions shown are nominal.  
 L = Linear Feet of C.M.P. required to fabricate fitting.

June 26, 2001

<b>S D D O T</b>	<b>C.M.P. FABRICATED LENGTHS FOR ELBOWS</b>	PLATE NUMBER <b>450.32</b>
	Published Date: 2024	Sheet 1 of 1



Alternate Type Connector Sections may be used with approval of the Engineer.

Dia. D (in.)	Ga.	DIMENSIONS (in.)					Approx. Slope	Body
		A	B	H	L	W		
12	16	6	6	6	21	24	2 1/2:1	1 Pc.
15	16	7	8	6	26	30	2 1/2:1	1 Pc.
18	16	8	10	6	31	36	2 1/2:1	1 Pc.
21	16	9	12	6	36	42	2 1/2:1	1 Pc.
24	16	10	13	6	41	48	2 1/2:1	1 Pc.
30	14	12	16	8	46	60	2 1/2:1	1 Pc.
36	14	14	19	9	51	72	2 1/2:1	2 Pc.
42	12	16	22	11	60	84	2 1/2:1	2 Pc.
48	12	18	27	12	69	90	2 1/4:1	2 Pc.
54	12	18	30	12	78	102	2:1	3 Pc.
60	12	18	33	12	84	114	1 3/4:1	3 Pc.
66	12	18	36	12	87	120	1 1/2:1	3 Pc.
72	12	18	39	12	87	126	1 1/3:1	3 Pc.
78	12	18	42	12	87	132	1 1/4:1	3 Pc.
84	12	18	45	12	87	138	1 1/6:1	3 Pc.

**STANDARD CONNECTIONS**

NOTE: Tubing is slipped over the sheet and rivets or lugs prior to forming operations of the apron.

**TUBING ATTACHMENT DETAILS SECTION A-A**

**TYPICAL CROSS-SECTION**

**SECTION A-A (alternate)**

**SECTION A-A (alternate)**

**GENERAL NOTES:**

All 3 pc. bodies shall have 12 Ga. sides and 10 Ga. center panels. Width of center panels shall be greater than 20% of the pipe periphery. Multiple panel bodies to have lap seams tightly joined by 3/8" Dia. galvanized rivets or bolts.

For 60" through 84" sizes, reinforced edges shall be supplemented with galvanized stiffener angles. The angles will be 2" x 2" x 1/4" for 60" through 72" diameters and 2 1/2" x 2 1/2" x 1/4" for 78" and 84" diameters. The angles shall be attached by 3/8" diameter galvanized nuts and bolts.

Rivets and Bolts shall be 3/8" Dia. Min. for 10 Ga. and 12 Ga. sheet, and 5/16" Dia. Min. for 14 Ga. and 16 Ga. sheets. Tighten nuts with torque wrench to 25 lbs. torque.

March 31, 2000

**INLET (CMP to RCP Transition)**

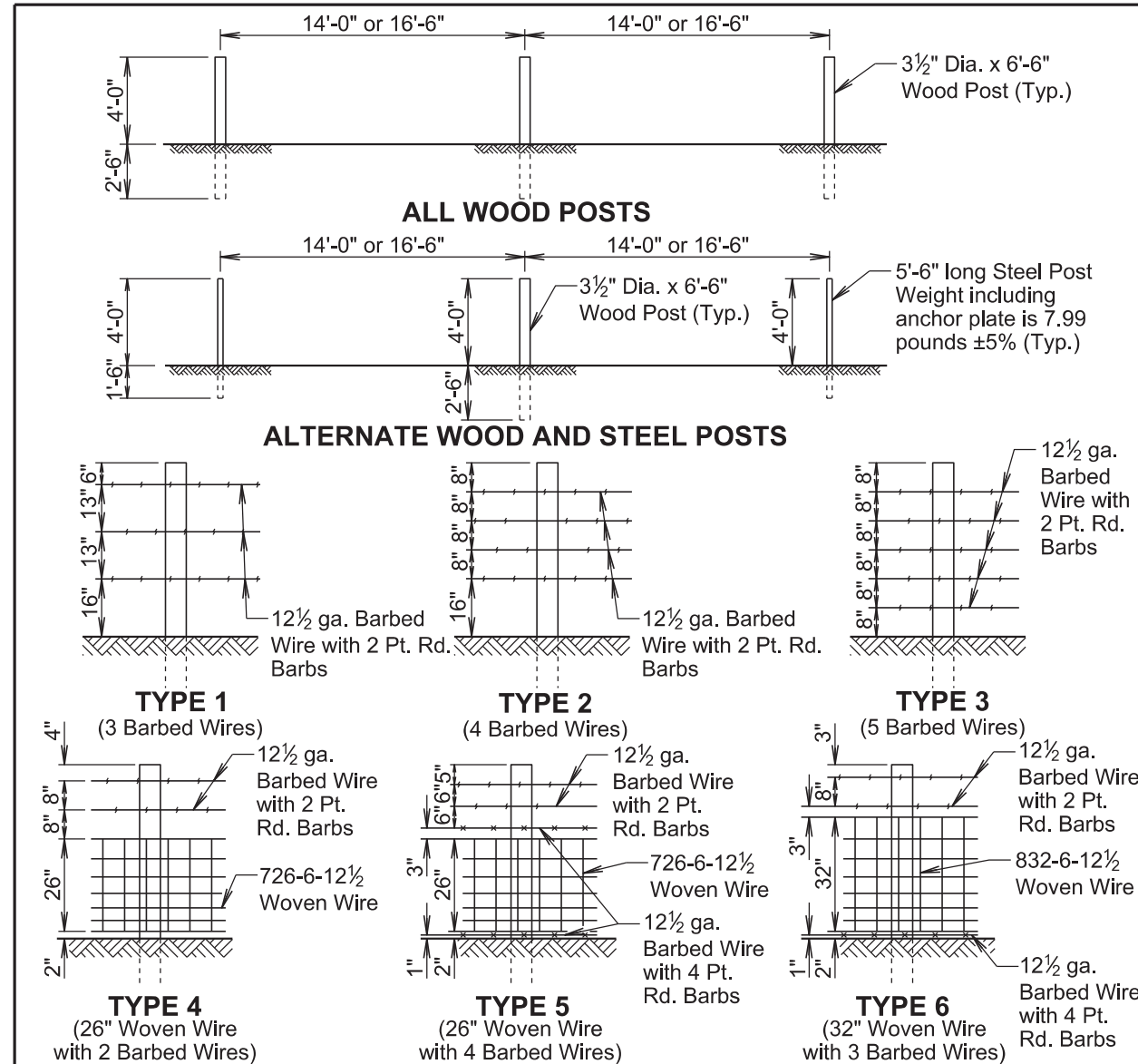
**OUTLET (RCP to CMP Transition)**

**GENERAL NOTE:**

Arch pipe transitions will be fabricated similar to the round transition shown above.

All pipe transitions will be precast as shown. Alternate designs other than shown will need to be approved by the Engineer.

November 19, 2022



TYPE OF FENCE		LINE POST SPACING	WIRE GAGE	BARBED WIRE	WOVEN WIRE
TYPE	DESCRIPTION			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:**

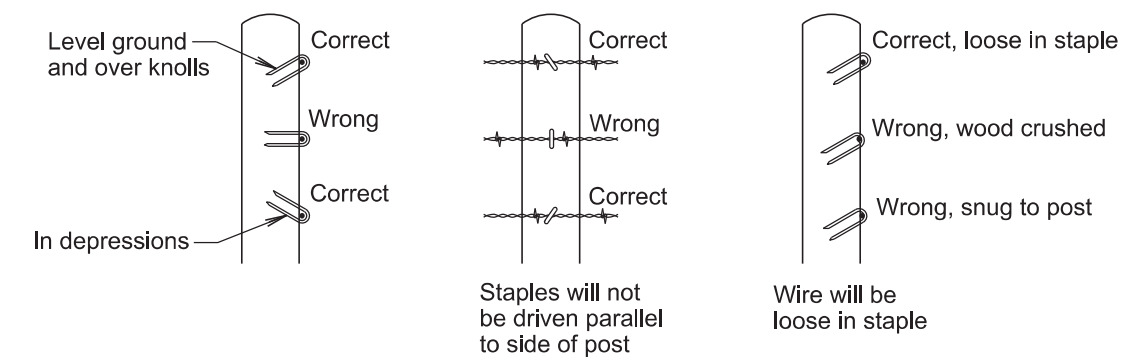
Fence types designated on the plans that are followed by the letter S will have smooth (barbless) wires.

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.

June 26, 2019

<b>S D D O T</b>	<b>RIGHT-OF-WAY FENCE</b>	PLATE NUMBER <b>620.01</b>
	Published Date: 2024	Sheet 1 of 1



**STAPLE INSTALLATION**

**GENERAL NOTES:**

The Right-of-Way fence will consist of barbed wire or a combination of woven wire and barbed wire. The barbed wire and/or woven wire will be fastened to all wood posts or fastened to alternating wood and steel posts. Only wood posts will be used for brace panels. Gates will be of the type designated in the plans or as otherwise directed by the Engineer. Fence will be constructed conforming to the details on the standard plates and in the plans unless otherwise directed by the Engineer.

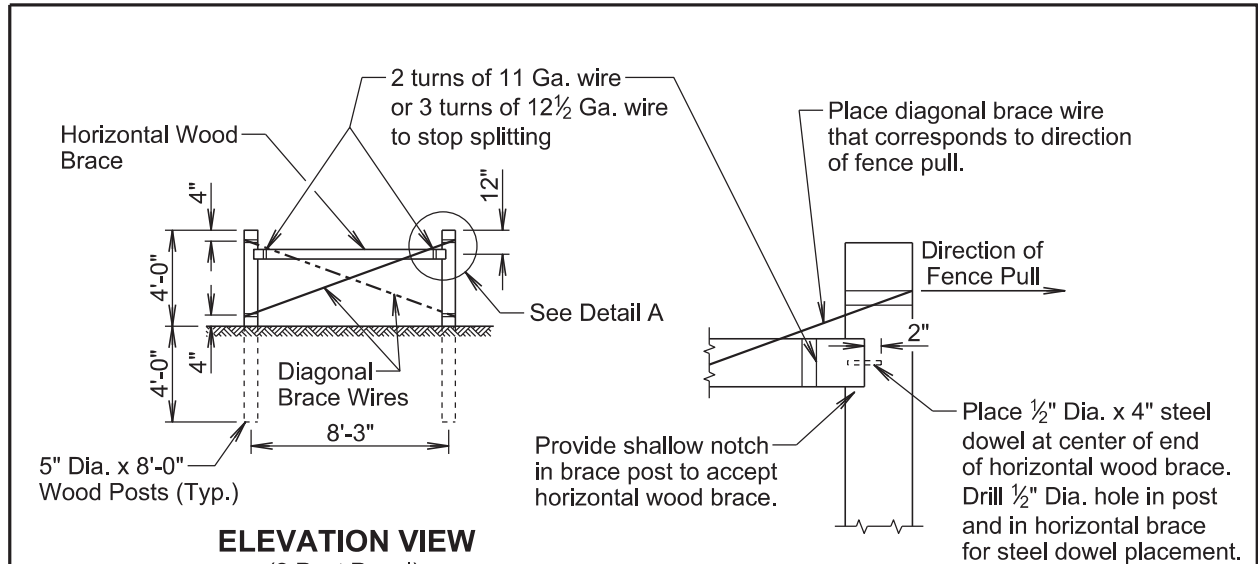
Right-of-Way fence on Interstate Projects will be constructed one foot within the Interstate Right-of-Way lines except at bridge openings, cattle passes, and as otherwise directed by the Engineer.

Right-of-Way fence other than on Interstate Projects will be constructed within one foot of the Right-of-Way on the Landowner's side except at bridge openings, cattle passes, and as otherwise directed by the Engineer.

Barbs will be fabricated from zinc coated 14 ga. wire. Two point barbs will be wrapped twice around one main strand at four-inch spacings and the four point barbs will be interlocked and wrapped around both main strands at five-inch spacings.

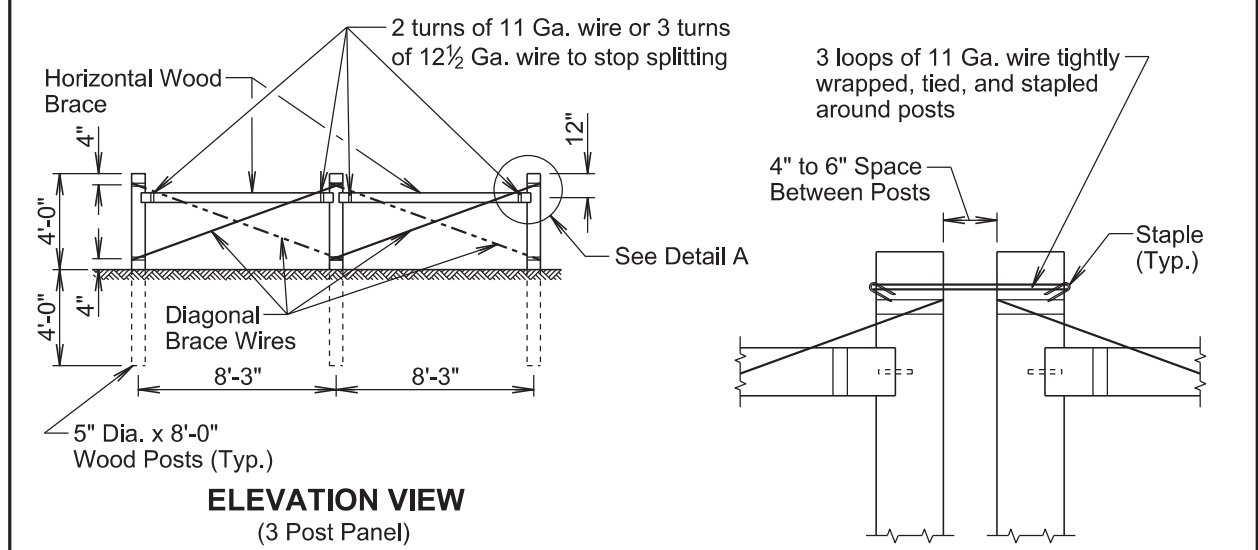
The gages of wire and wood post lengths and sizes are the minimum acceptable unless otherwise specified in the plans. The tolerances for steel posts will be as stated in AASHTO M281. Woven wire will conform to design and specifications of ASTM A116 and barbed wire will conform to ASTM A121.

<b>S D D O T</b>	<b>STAPLE INSTALLATION AND GENERAL RIGHT-OF-WAY FENCE NOTES</b>	PLATE NUMBER <b>620.02</b>
	Published Date: 2024	Sheet 1 of 1



**ELEVATION VIEW**  
(2 Post Panel)

**DETAIL A**



**ELEVATION VIEW**  
(3 Post Panel)

**DETAIL B**

**GENERAL NOTES:**

Two Post Panels will be installed at least every 1320' between corners.

Two Post Panels will be installed at any sharp vertical angle crest points and as directed by the Engineer.

Horizontal wood braces will consist of 4" dia. x 8' wood posts or rough 4" x 4" x 8' timbers.

Diagonal brace wires will be fabricated with 4 strands of 9 Ga. galvanized wire twisted tight. The diagonal brace wires will be installed in accordance with the direction of the fence pull. Two diagonal brace wires are required if fence pull is in both directions.

January 22, 2023

<b>S D D O T</b>	<b>BRACE PANELS AND APPLICATIONS OF BRACE PANELS</b>	PLATE NUMBER <b>620.03</b>
		Sheet 1 of 3

RADIUS OF CURVE	SPACING OF 2 POST PANEL
Greater than 1800 Ft.	** 1320'
Less than 1800 Ft.	** At P.C., P.T., and at every 1320' between P.C. and P.T.

**GENERAL NOTE:**

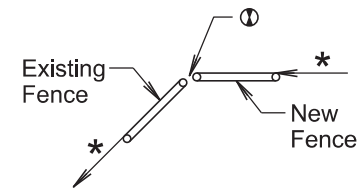
All degrees of curvature stated for fence are at centerline of roadway.

If fence length is less than 600' to next corner use a 2 post panel.

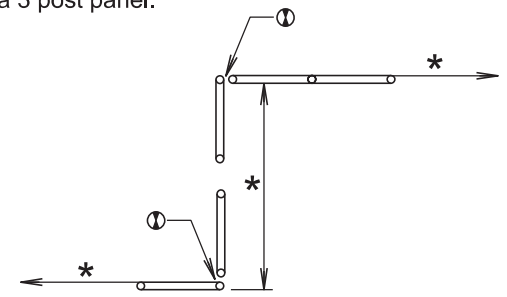
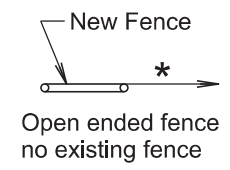
\* If fence length is greater than 600' to next corner use a 3 post panel.

\*\* Fence lengths greater than 1320' and less than 2640' place 2 Post Panel approximately at midpoint.

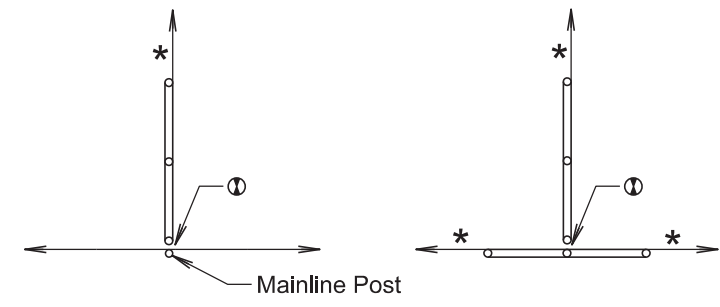
① See Detail B on Sheet 1 of 3.



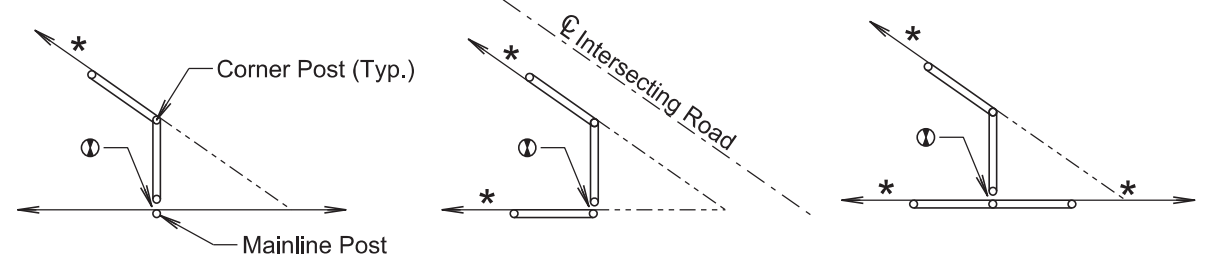
**BEGIN OR END FENCE**  
(Where new fence ties into existing fence)



**SHORT JOGS IN FENCE**



**CROSS FENCE**



**SHARP ANGLES IN CROSS FENCE**



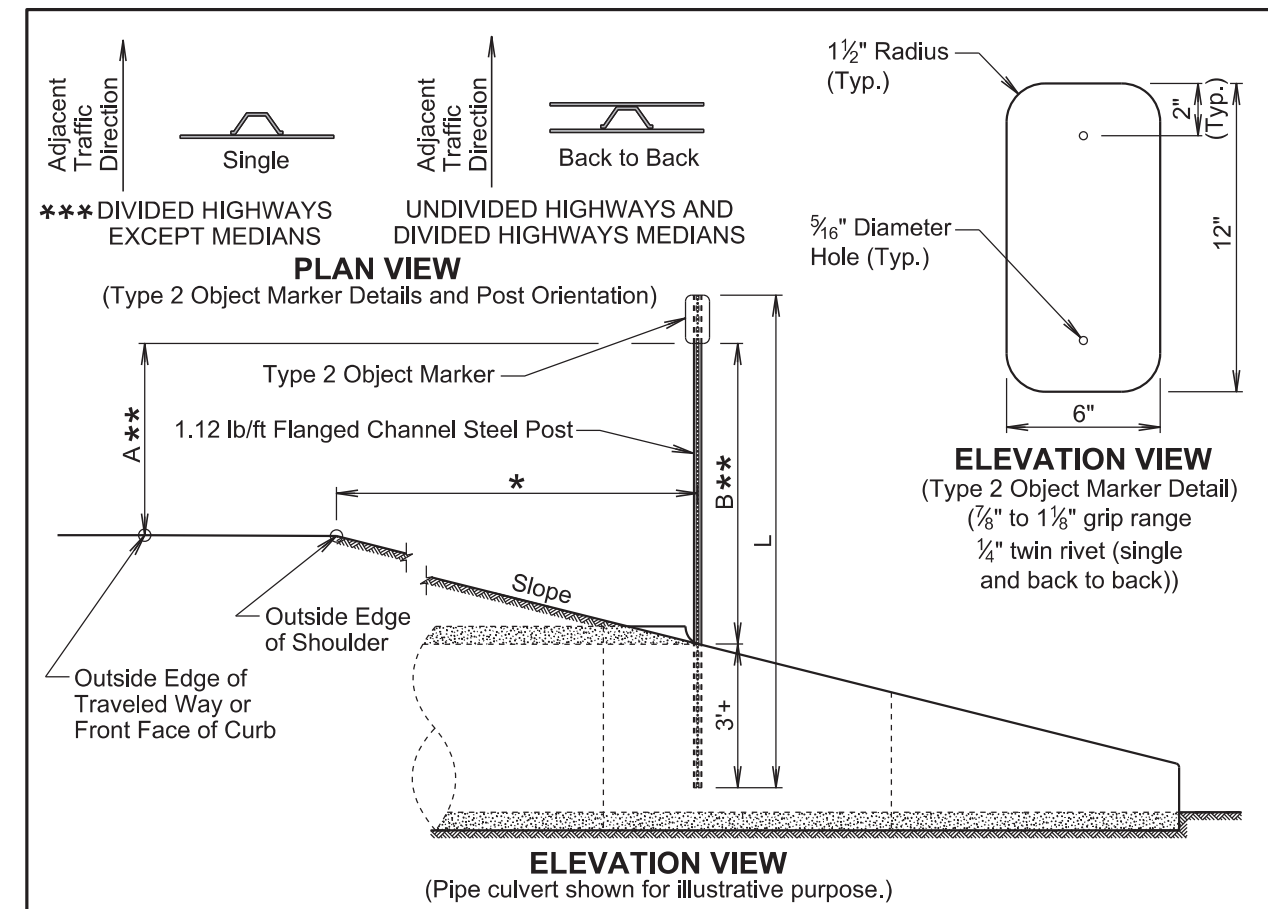
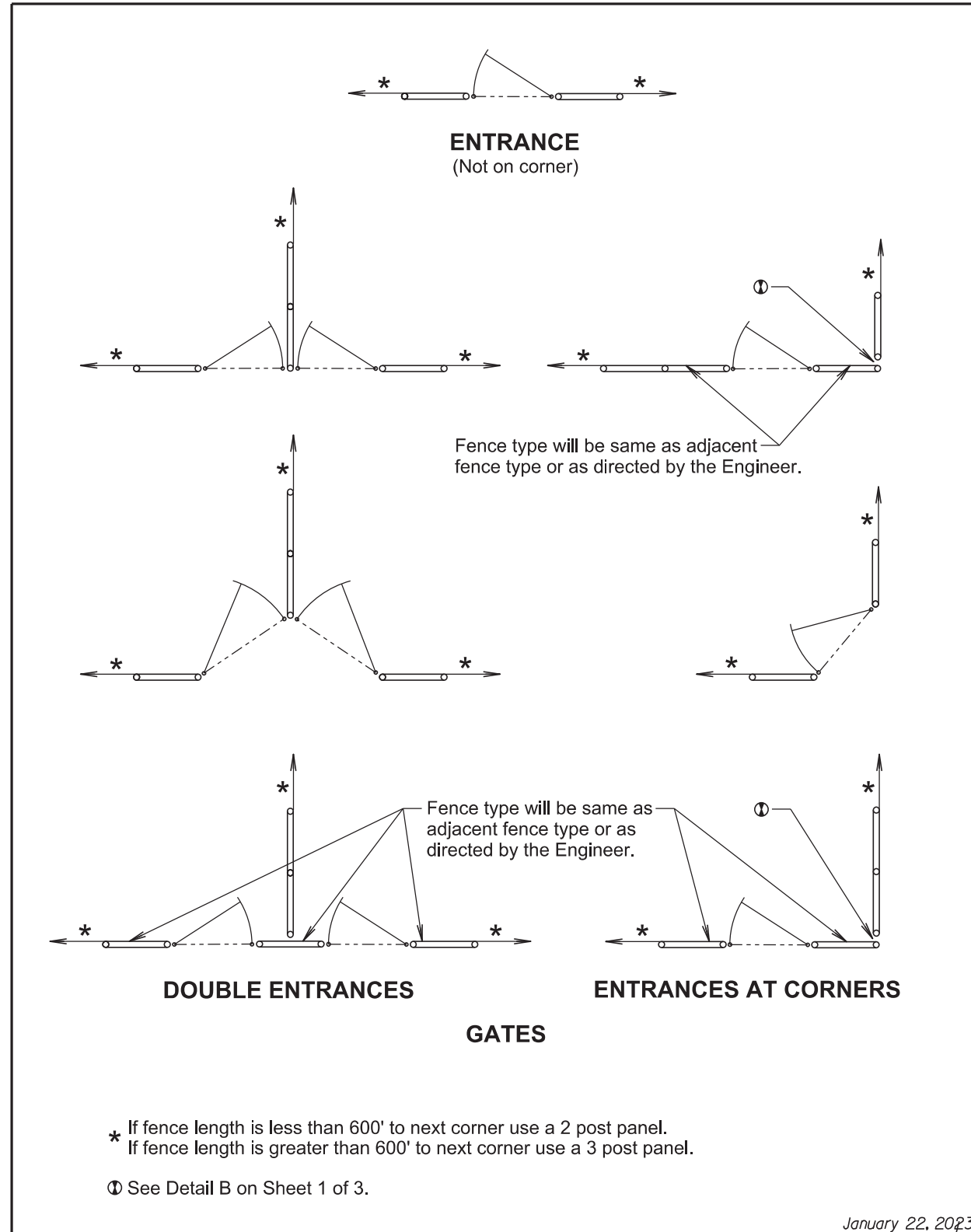
Additional fence panel is NOT required when an angle in the mainline fence is 10° and less.

Additional fence panel is required when an angle in the mainline fence is greater than 10°.

**ANGLES IN MAINLINE FENCE**

January 22, 2023

<b>S D D O T</b>	<b>BRACE PANELS AND APPLICATIONS OF BRACE PANELS</b>	PLATE NUMBER <b>620.03</b>
	Published Date: 2024	Sheet 2 of 3



TYPE 2 OBJECT MARKER POST LENGTHS										
OFFSET (*)	1'	2'	3'	4'	5'	6'	7'	8'	Greater Than 8'	
<b>POST LENGTH (L)</b>										
SLOPE	3:1	8'-6"	8'-9"	9'-3"	9'-6"	9'-9"	10'-3"	10'-6"	10'-9"	8'-0"
	4:1	8'-6"	8'-9"	9'-0"	9'-3"	9'-9"	9'-9"	10'-0"	10'-3"	8'-0"
	5:1	8'-3"	8'-6"	8'-9"	9'-0"	9'-3"	9'-3"	9'-6"	9'-9"	8'-0"
	6:1	8'-3"	8'-6"	8'-9"	8'-9"	9'-0"	9'-3"	9'-3"	9'-6"	8'-0"

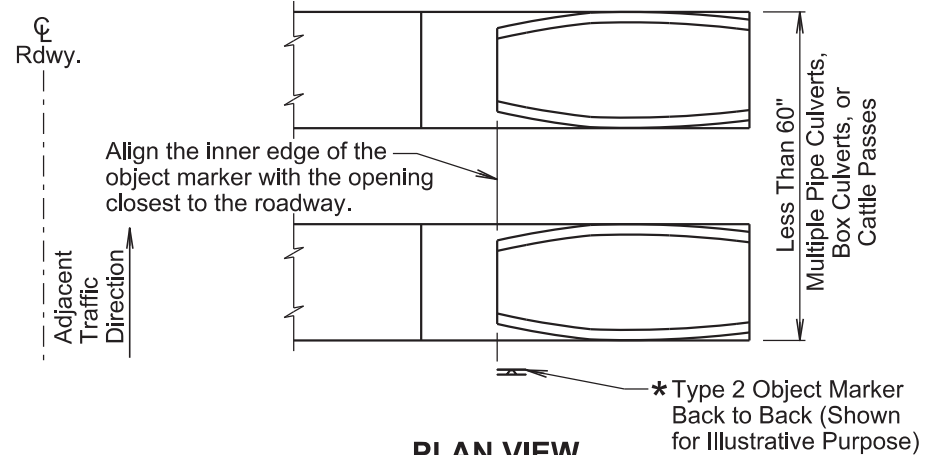
**GENERAL NOTES:**

\*\*\* The type 2 object marker may be installed back to back when specified in the plans.  
Post Length L was calculated based on a shoulder width of 6 feet at a crossslope of 4 percent and L was rounded up to the nearest 3 inches.

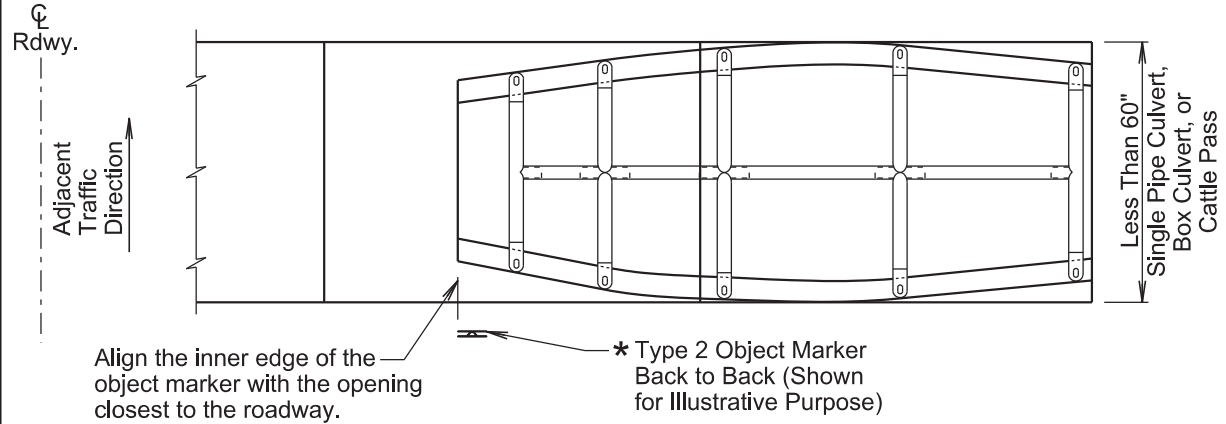
\*\* Dimension A is 4 feet when the Offset \* is 8 feet and less. Dimension B is 4 feet when Offset \* is greater than 8 feet.

The type 2 object marker and the 1.12 lb/ft flanged channel steel post will be in conformance with Specifications Section 982.2 J.

Payment for the type 2 object marker will be in conformance with Specification Section 632.5 B.



**PLAN VIEW**  
(For Multiple Pipe Culverts, Box Culverts, and Cattle Passes)  
(Pipe culverts shown for illustrative purpose.)  
(Embankment is not shown.)



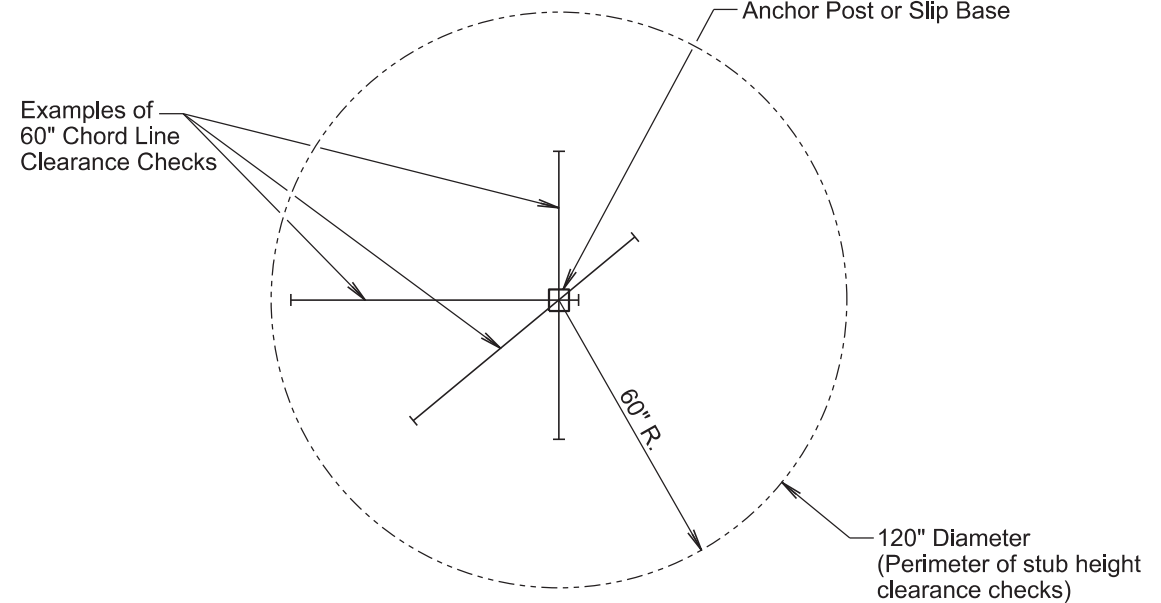
**PLAN VIEW**  
(For Single Pipe Culvert, Box Culvert, and Cattle Pass)  
(Pipe culvert shown for illustrative purpose.)  
(Embankment is not shown.)

**GENERAL NOTES:**

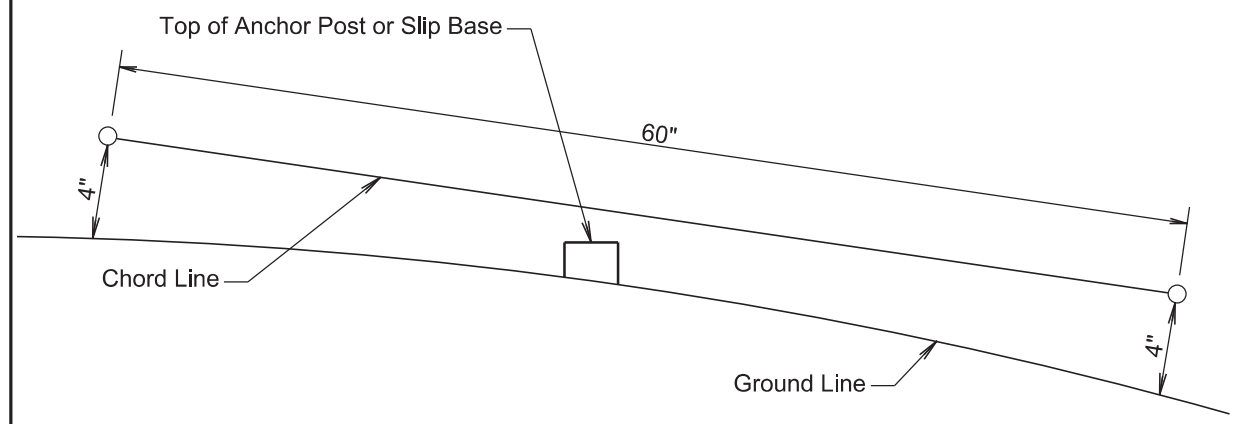
This standard plate will be used in conjunction with standard plate 632.01.  
\* The type 2 object markers will be installed at the locations shown above. The type 2 object markers, single faced or back to back, will be as specified in the plans.

December 23, 2019

<b>S D D O T</b>	<b>TYPE 2 OBJECT MARKER AT PIPE CULVERTS, BOX CULVERTS, AND CATTLE PASSES (Less than 60" Overall Width)</b>	PLATE NUMBER <b>632.03</b>
	Published Date: 2024	Sheet 1 of 1



**PLAN VIEW**  
(Examples of stub height clearance checks)



**ELEVATION VIEW**

**GENERAL NOTES:**

The top of anchor posts and slip bases WILL NOT extend above a 60" chord line within a 120" diameter circle around the post with ends 4" above the ground.  
At locations where there is curb and gutter adjacent to the breakaway sign support, the stub height will be a maximum of 4" above the ground line at the localized area adjacent to the breakaway support stub.

January 22, 2021

<b>S D D O T</b>	<b>BREAKAWAY SUPPORT STUB CLEARANCE</b>	PLATE NUMBER <b>632.18</b>
	Published Date: 2024	Sheet 1 of 1

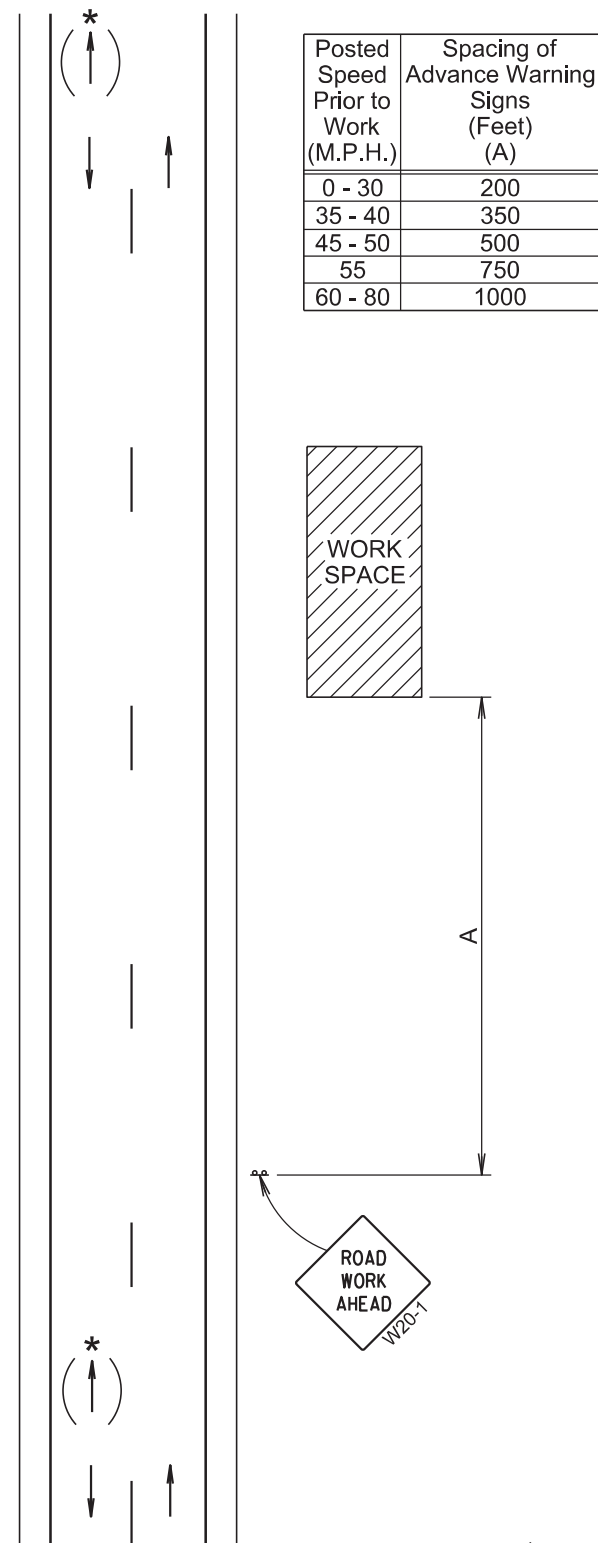
The signs illustrated are not required if the work space is behind a barrier, more than 2 feet behind the curb, or 15 feet or more from the edge of any roadway.

The signs illustrated will be used where there are distracting situations; such as: vehicles parked on shoulder, vehicles accessing the work site via the highway, and equipment traveling on or crossing the roadway to perform work operations.

The ROAD WORK AHEAD sign may be replaced with other appropriate signs, such as the SHOULDER WORK sign. The SHOULDER WORK sign may be used for work adjacent to the shoulder.

\* If the work space is on a divided highway, an advance warning sign should also be placed on the left side of the directional roadway.

For short term, short duration, or mobile operations, all signs and channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.



January 22, 2021

Published Date: 2024	S D D O T	WORK BEYOND THE SHOULDER	PLATE NUMBER 634.01
			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	500	25
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) will 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.

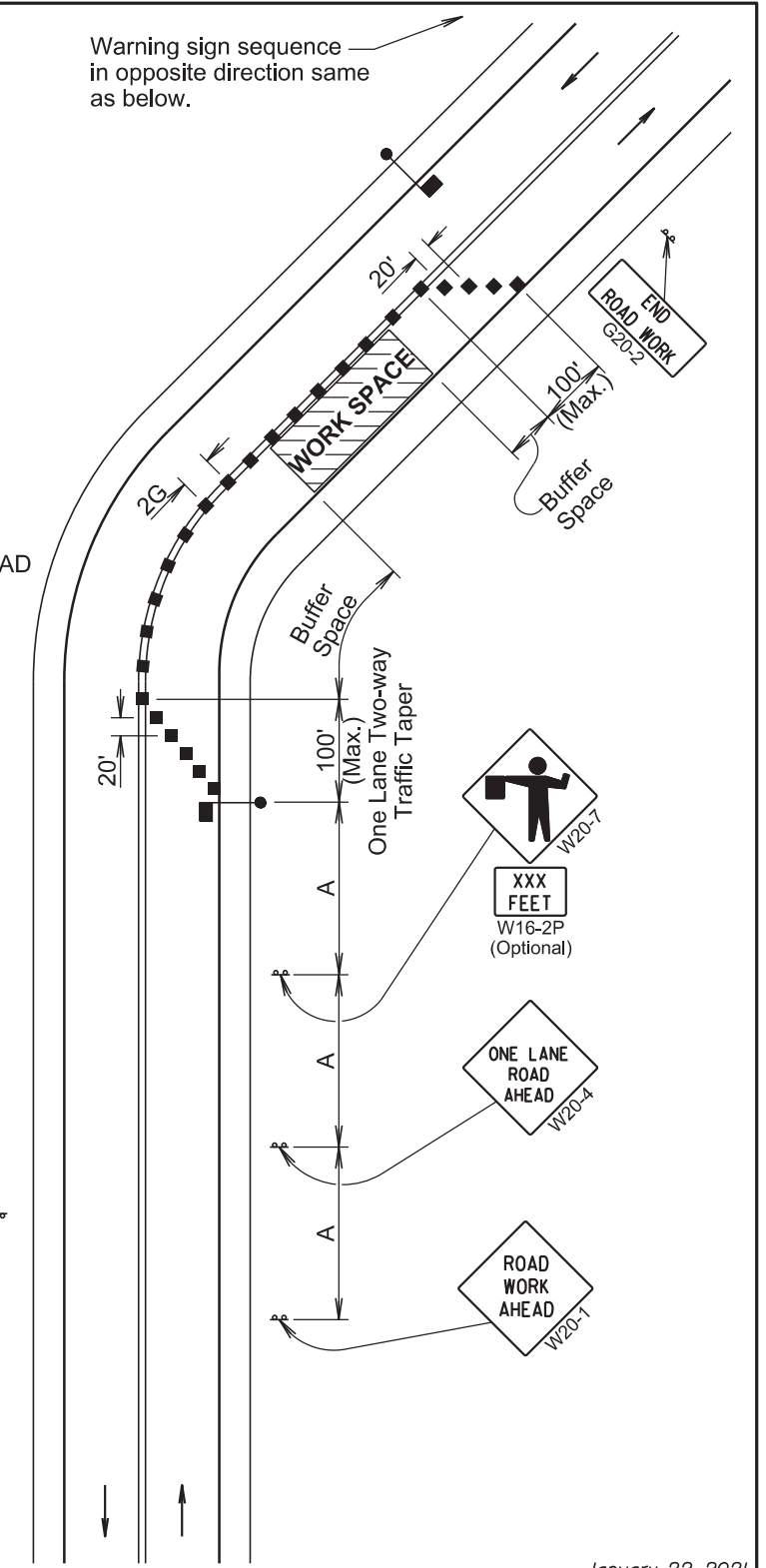
The channelizing devices will be drums or 42" cones.

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 will be used at intersecting roads to control intersecting road traffic as required.

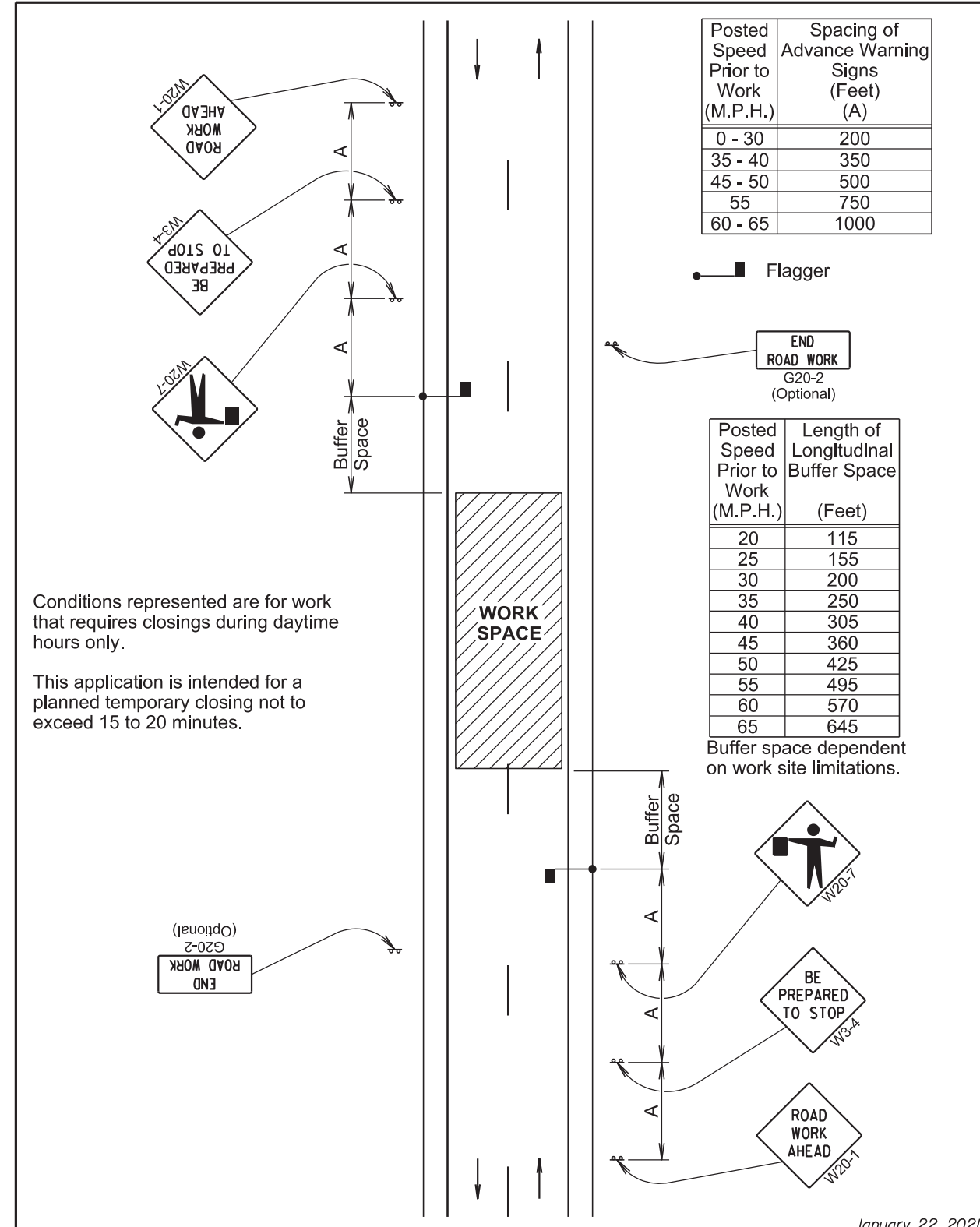
The buffer space should be extended so that the two-way traffic taper is placed before a horizontal or vertical curve to provide adequate sight distance for the flagger and queue of stopped vehicles.

The length of A may be adjusted to fit field conditions.



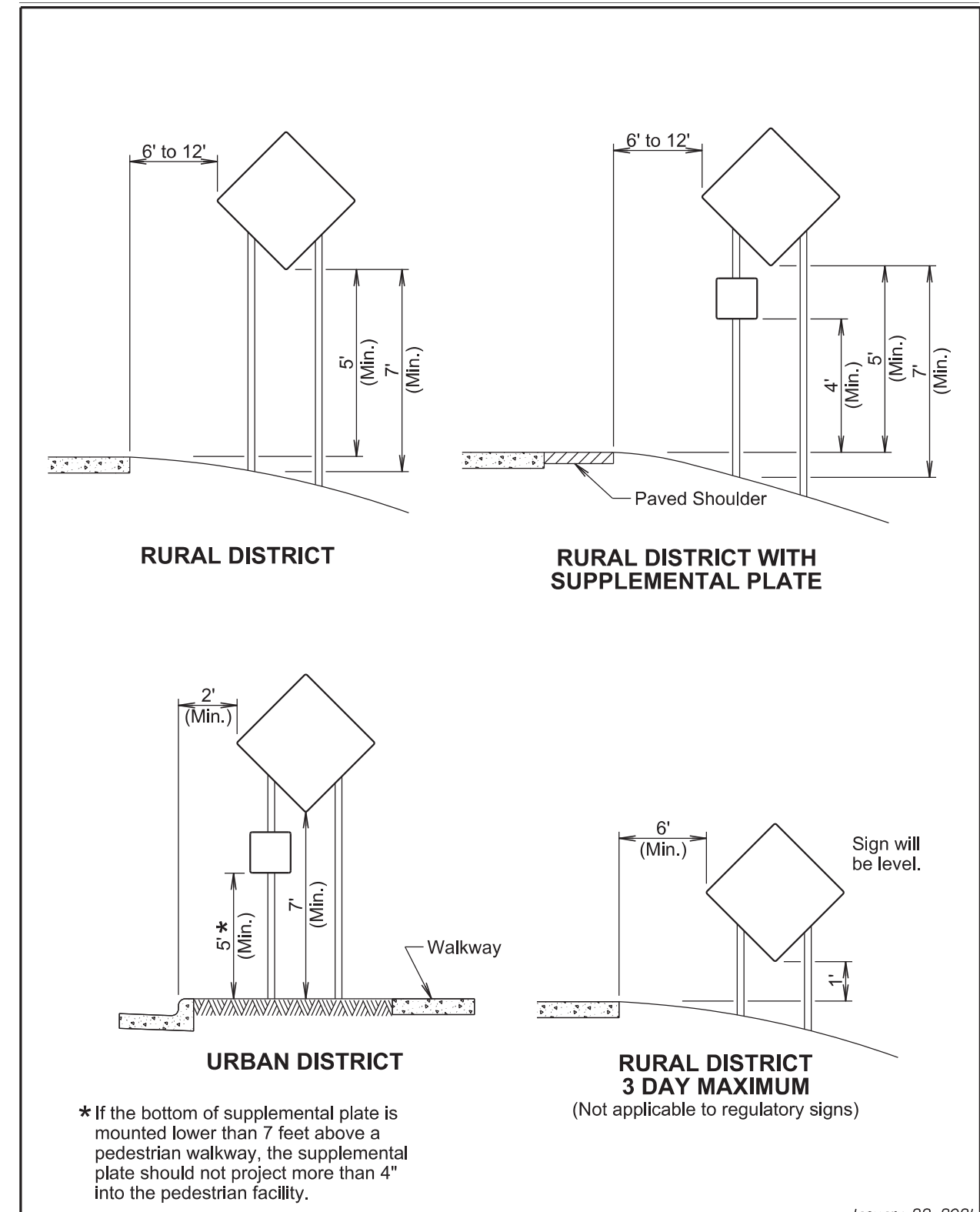
January 22, 2021

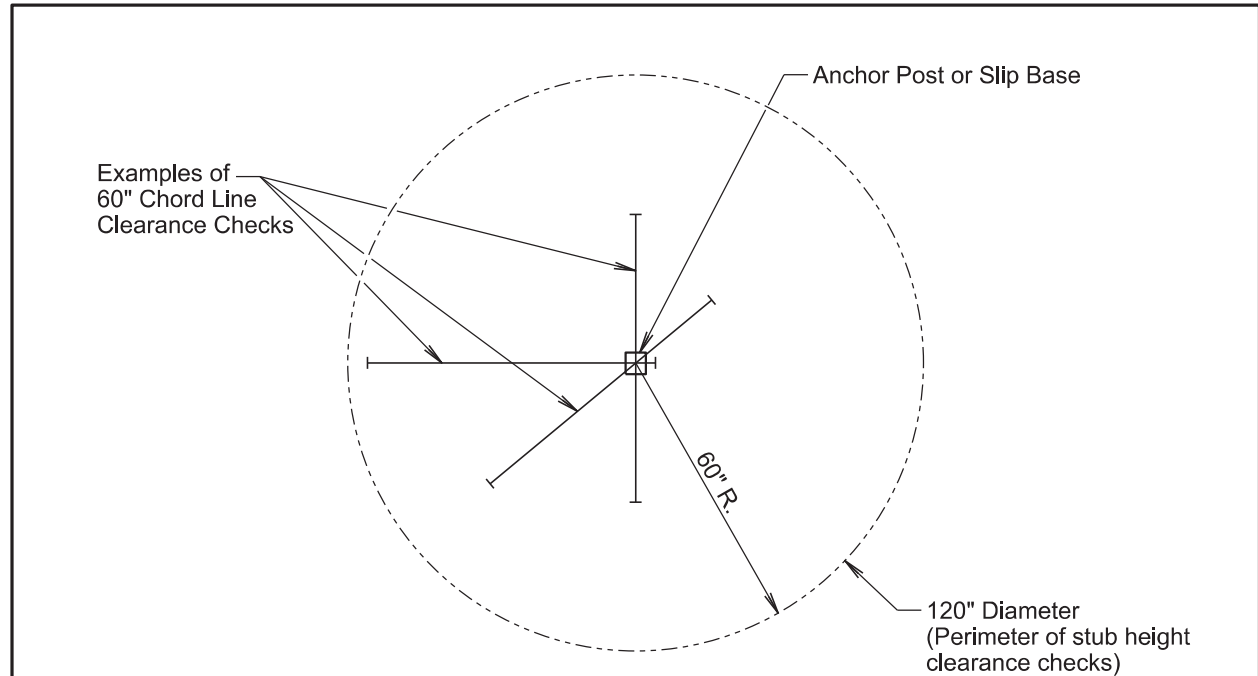
Published Date: 2024	S D D O T	LANE CLOSURE WITH FLAGGER PROVIDED	PLATE NUMBER 634.23
			Sheet 1 of 1



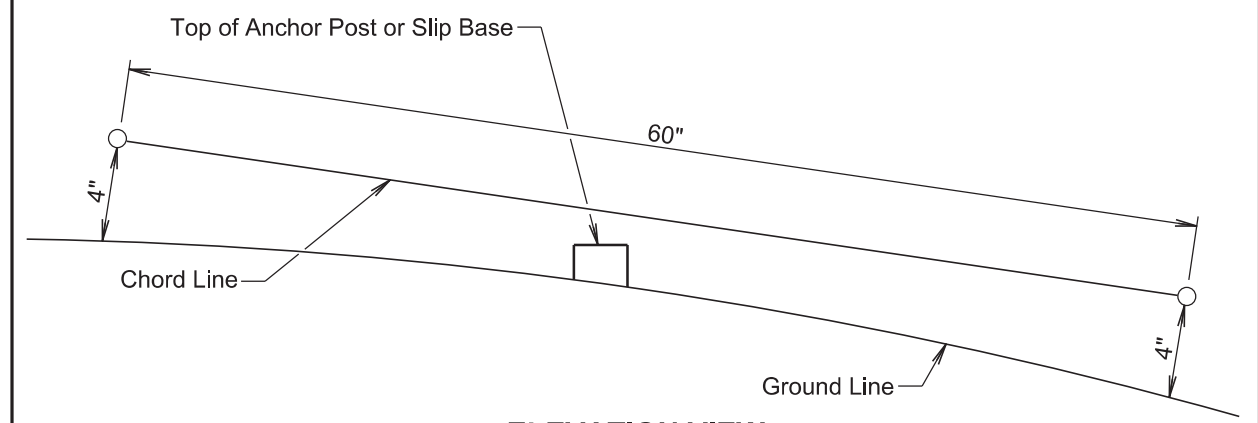
Conditions represented are for work that requires closings during daytime hours only.

This application is intended for a planned temporary closing not to exceed 15 to 20 minutes.





**PLAN VIEW**  
(Examples of stub height clearance checks)



**ELEVATION VIEW**

**GENERAL NOTES:**

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

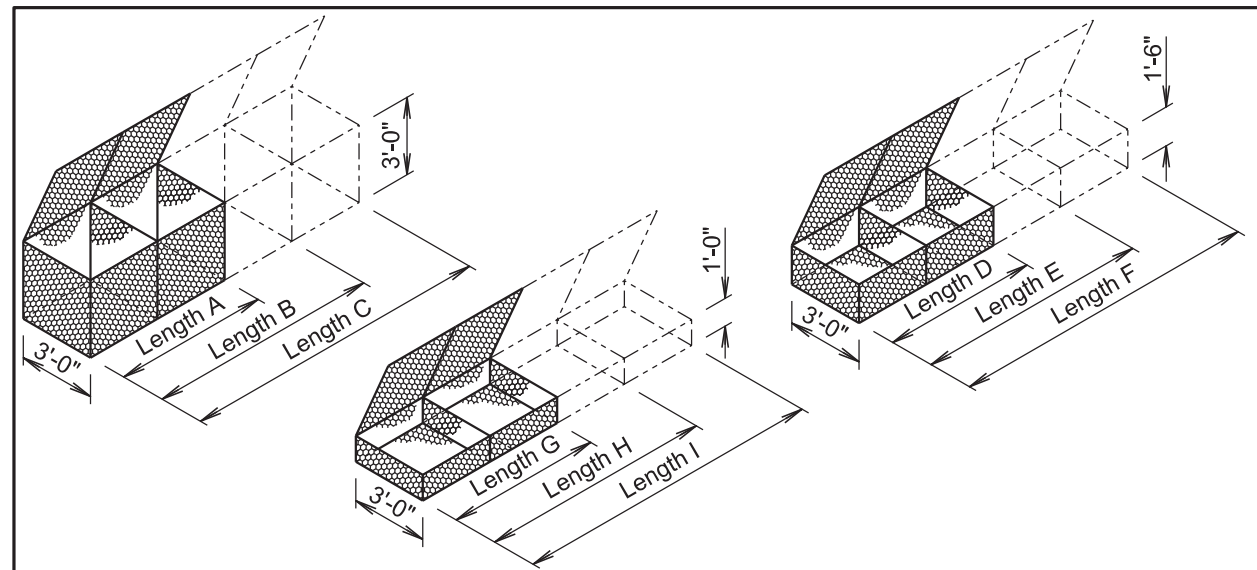
At locations where there is curb and gutter adjacent to the breakaway sign support, the stub height will be a maximum of 4" above the ground line at the localized area adjacent to the breakaway support stub.

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

January 22, 2021

<b>S D D O T</b>	<b>BREAKAWAY SUPPORT STUB CLEARANCE</b>	PLATE NUMBER <b>634.99</b>
		Sheet 1 of 1

Published Date: 2024



**GABION DETAILS**

STANDARD SIZES					
SIZE	LENGTH	WIDTH	HEIGHT	NUMBER OF CELLS	CAPACITY (Cu. Yd.)
A	6'-0"	3'-0"	3'-0"	2	2.0
B	9'-0"	3'-0"	3'-0"	3	3.0
C	12'-0"	3'-0"	3'-0"	4	4.0
D	6'-0"	3'-0"	1'-6"	2	1.0
E	9'-0"	3'-0"	1'-6"	3	1.5
F	12'-0"	3'-0"	1'-6"	4	2.0
G	6'-0"	3'-0"	1'-0"	2	0.7
H	9'-0"	3'-0"	1'-0"	3	1.0
I	12'-0"	3'-0"	1'-0"	4	1.3

**GENERAL NOTES:**

Above dimensions subject to mill tolerances.

Lacing and internal connecting wire will be 0.0866 inch diameter steel wire ASTM A641, Class 3 soft temper measured after galvanizing and for PVC coated gabions will be 0.0866 inch diameter steel wire measured after galvanizing but before PVC coating.

The lacing procedure is as follows:

1. Cut a length of lacing wire approximately 1½ times the distance to be laced but not exceeding 5 feet.
2. Secure the wire terminal at the corner by looping and twisting.
3. Proceed lacing with alternating single and double loops at a spacing not to exceed 6 inches.
4. Securely fasten the other lacing wire terminal.

Wire lacing or interlocking type fasteners will be used for gabion assembly and final construction of gabion structures. Interlocking fasteners for galvanized gabions will be high tensile 0.120 inch diameter galvanized steel wire measured after galvanizing. The galvanizing will conform to ASTM A641-92, Class 3 coating. Fasteners will also be in accordance with ASTM A764, Class II, Type III.

Interlocking fasteners for PVC coated gabions will be high tensile 0.120 inch diameter stainless steel wire conforming to ASTM A313, Type 302, Class 1. The spacing of the interlocking fasteners during all phases of assembly and construction will not exceed 6 inches.

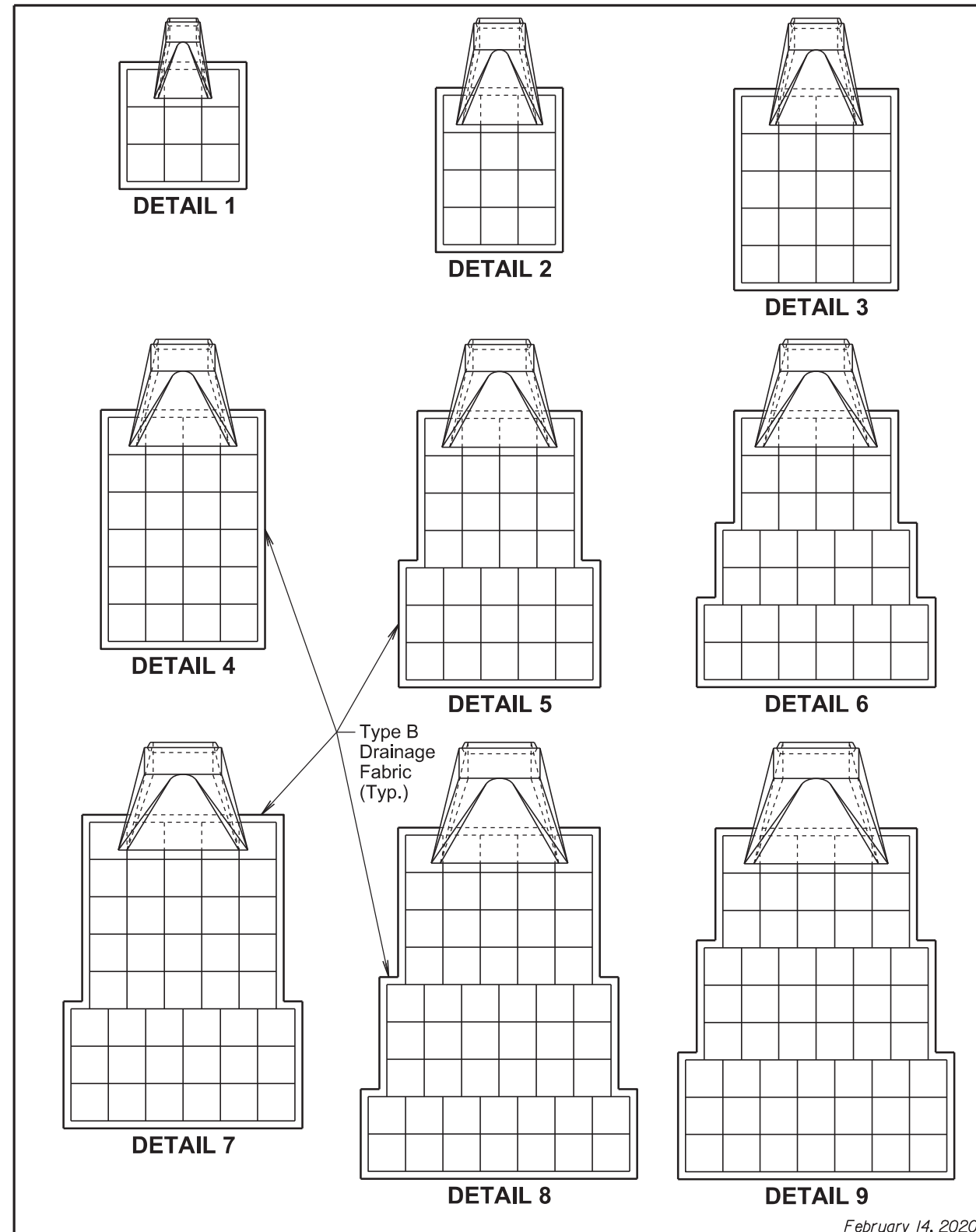
All fasteners will be placed where the mesh weaves around the selvage wire at the vertical and horizontal joints.

February 14, 2020

<b>S D D O T</b>	<b>BANK AND CHANNEL PROTECTION GABIONS</b>	PLATE NUMBER <b>720.01</b>
		Sheet 1 of 1

Published Date: 2024





February 14, 2020

Published Date: 2024	S D D O T	BANK AND CHANNEL PROTECTION GABION PLACEMENT UNDER PIPE END SECTIONS	PLATE NUMBER 720.03
			Sheet 1 of 2

* ESTIMATED QUANTITIES			
Detail	Pipe Diameter (Inches)	Gabion (Cu. Yd.)	Type B Drainage Fabric (Sq. Yd.)
RCP, RCP Arch, CMP, and CMP Arch	1	12, 18, and 24	4.5
	2	30 and 36	6.0
	3	42	10.0
	4	48 and 54	12.0
	5	60	15.5
	6	66	17.0
	7	72	21.5
	8	78	26.0
	9	84	27.0

**GENERAL NOTES:**

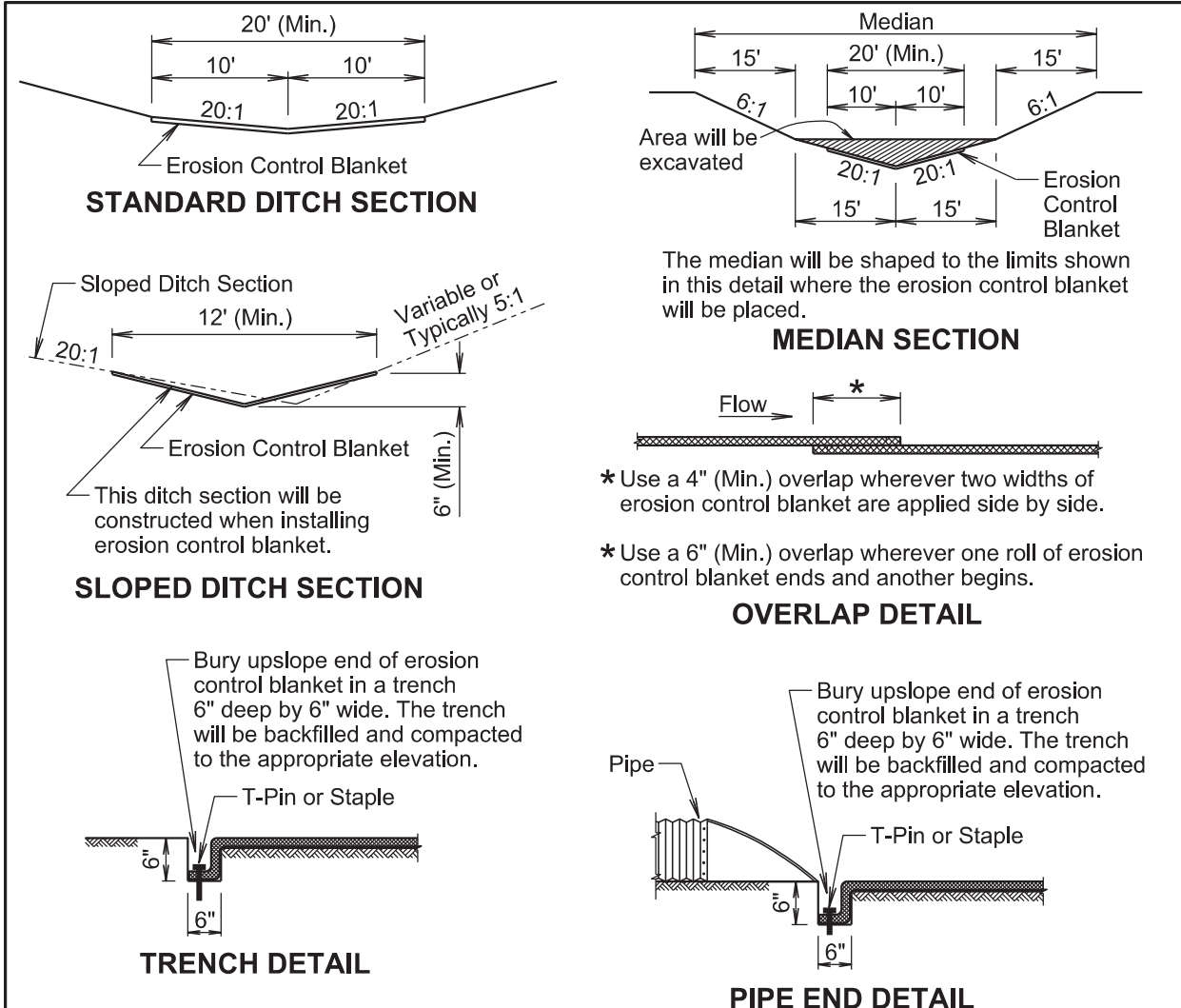
Gabions at outlets of CMP and RCP will be placed under the end section a distance of 2 feet from the outlet end. For CMP end section installations, the upper fabric of the gabions will be modified to accommodate the metal end section as approved by the Engineer.

\* Gabion and type B drainage fabric quantities on this standard plate are based on standard gabion sizes D, E, and F as depicted on standard plate 720.01.

Type B drainage fabric will be placed under the gabions and around the exterior sides (perimeter) of the gabions as approved by the Engineer. The type B drainage fabric will be in conformance with Section 831 of the Specifications. Measurement and payment of the type B drainage fabric will be in conformance with Section 720 of the Specifications.

February 14, 2020

Published Date: 2024	S D D O T	BANK AND CHANNEL PROTECTION GABION PLACEMENT UNDER PIPE END SECTIONS	PLATE NUMBER 720.03
			Sheet 2 of 2



**GENERAL NOTES:**

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

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

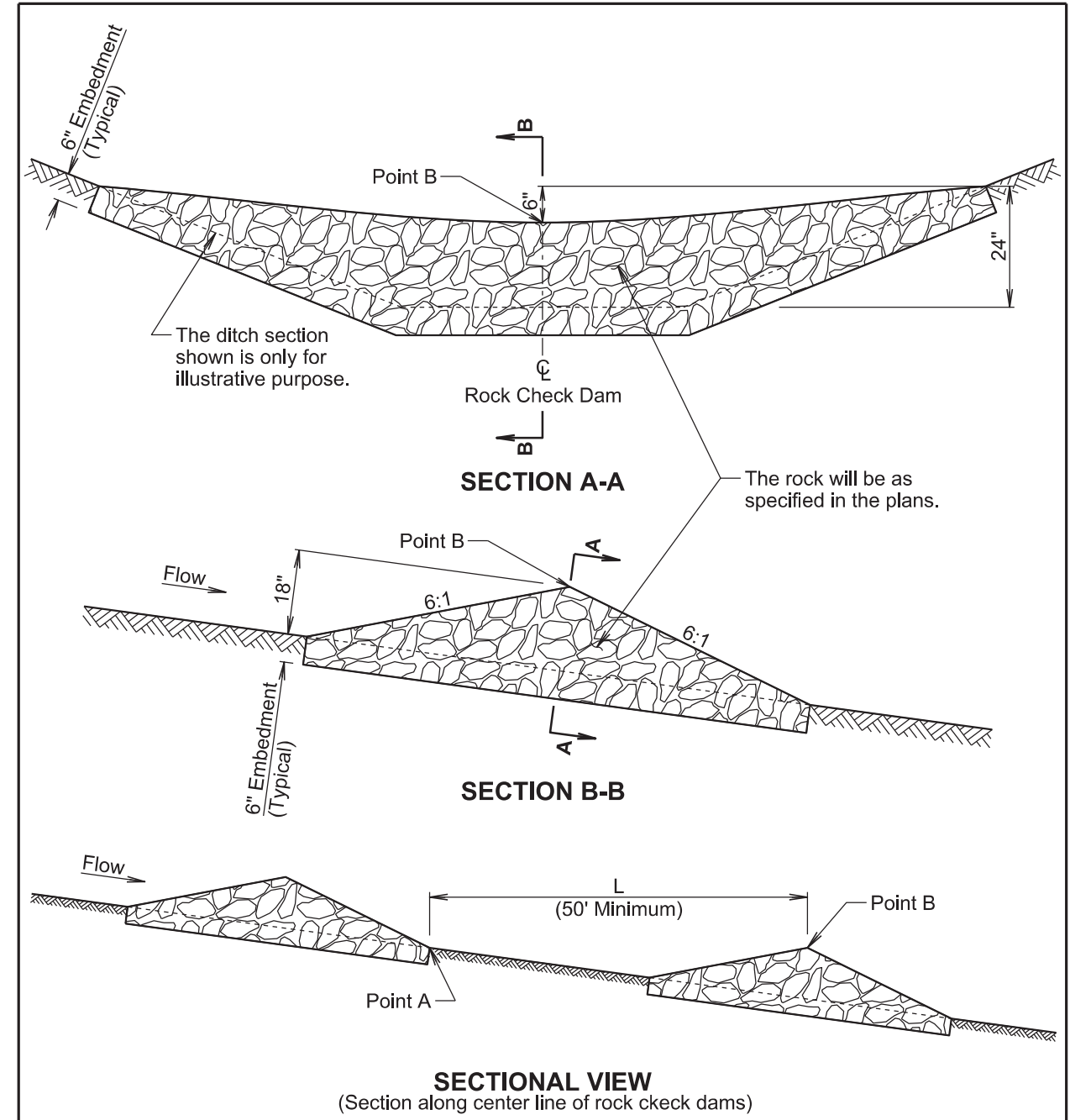
The erosion control blanket will be pinned to the ground according to the manufacturer's installation recommendations.

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

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

February 14, 2020

Published Date: 2024	S D D O T	EROSION CONTROL BLANKET	PLATE NUMBER 734.01
			Sheet 1 of 1



**GENERAL NOTES:**

The elevation of Point A and Point B will be the same. The distance L is the distance required such that Point A and Point B are at the same elevation.

All costs for constructing the rock check dam including labor, equipment, excavation, and rock will be incidental to the contract unit price per cubic yard for "Rock Check Dam".

February 14, 2020

Published Date: 2024	S D D O T	ROCK CHECK DAM	PLATE NUMBER 734.03
			Sheet 1 of 1



Spacing Varies (See Table)

Flow

See Detail B

CUT OR FILL SLOPE INSTALLATION	
Slope	Spacing (Ft.)
1:1	10
2:1	20
3:1	30
4:1	40

**ELEVATION VIEW**  
(Cut or Fill Slope Installation)

Excavated Material from Trench

Flow

2" to 3"

3" to 5" Trench

Wood Stake

9" (Min.)

**DETAIL B**  
(Typical of All Installations)

Ends of Erosion Control Wattles

Wood Stake

6"

**DETAIL C**  
(See General Notes)

Point A

Point B

Point A

Flow

**ISOMETRIC VIEW**  
(Ditch Installation)

DITCH INSTALLATION	
Grade	Spacing (Ft.)
2%	150
3%	100
4%	75
5%	50

Point A

Flow

Point A

Point B

Wood Stake (Typ.)

**PLAN VIEW**  
(Ditch Installation)

Point A

Point B

Point A

Wood Stake

**SECTION A-A**

February 14, 2020

**SD DOT**

**EROSION CONTROL WATTLE**

PLATE NUMBER  
734.06

Sheet 1 of 2

Published Date: 2024

**GENERAL NOTES:**

At cut or fill slope installations, wattles will be installed along the contour and perpendicular to the water flow.

At ditch installations, point A must be higher than point B to ensure that water flows over the wattle and not around the ends.

The Contractor will dig a 3" to 5" trench, install the wattle tightly in the trench so that daylight can not be seen under the wattle, and then compact the soil excavated from the trench against the wattle on the uphill side. See Detail B.

The stakes will be 1"x2" or 2"x2" wood stakes, however, other types of stakes such as rebar may be used only if approved by the Engineer. The stakes will be placed 6" from the ends of the wattles and the spacing of the stakes along the wattles will be 3' to 4'.

Where installing running lengths of wattles, the Contractor will butt the second wattle tightly against the first and will not overlap the ends. See Detail C.

The Contractor and Engineer will inspect the erosion control wattles in accordance with the storm water permit. The Contractor will remove, dispose, or reshape the accumulated sediment when necessary as determined by the Engineer.

Sediment removal, disposal, or necessary shaping will be as directed by the Engineer. All costs for removing accumulated sediment, disposal of sediment, and necessary shaping will be incidental to the contract unit price per cubic yard for "Remove Sediment".

All costs for furnishing and installing the erosion control wattles including labor, equipment, and materials will be incidental to the contract unit price per foot for the corresponding erosion control wattle contract item.

All costs for removing the erosion control wattle from the project including labor, equipment, and materials will be incidental to the contract unit price per foot for "Remove Erosion Control Wattle".

February 14, 2020

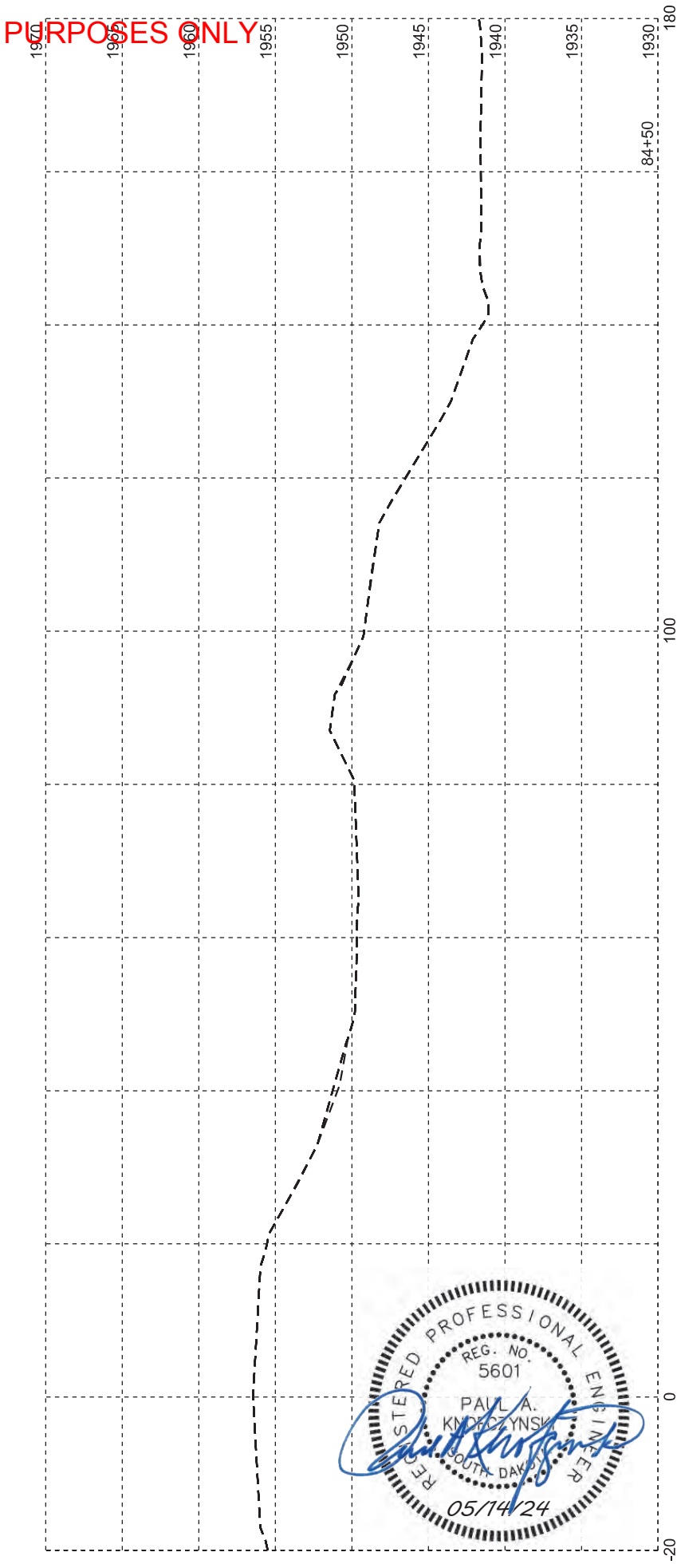
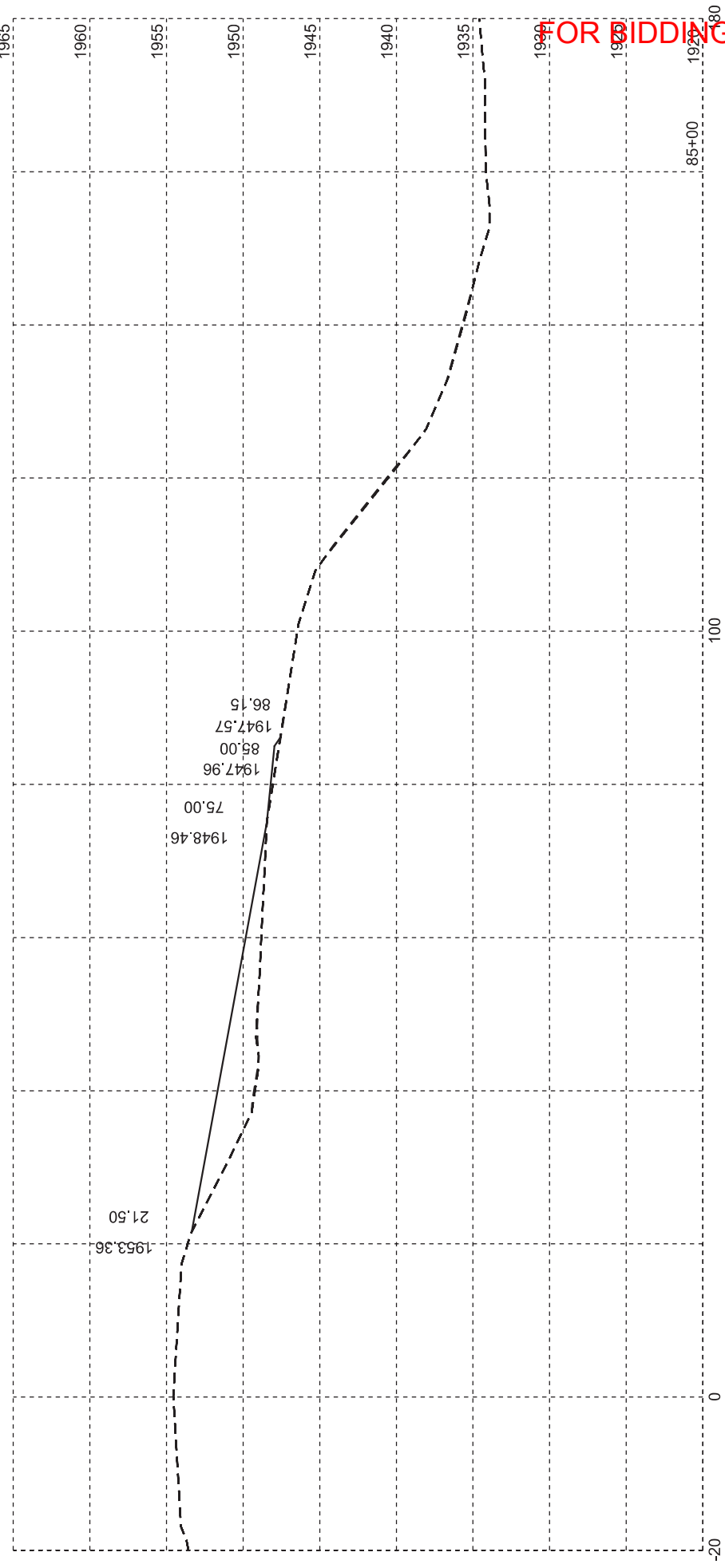
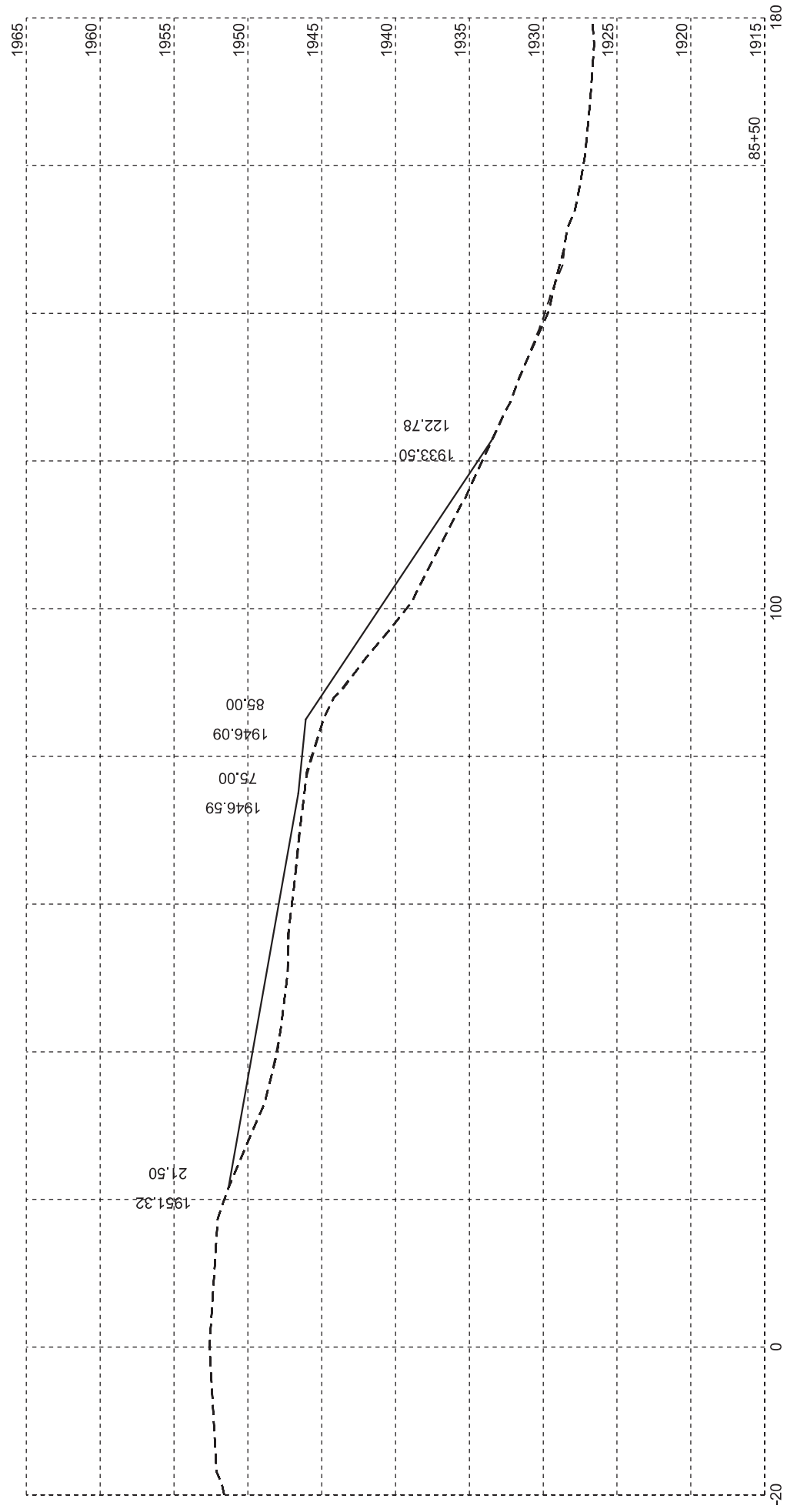
**SD DOT**

**EROSION CONTROL WATTLE**

PLATE NUMBER  
734.06

Sheet 2 of 2

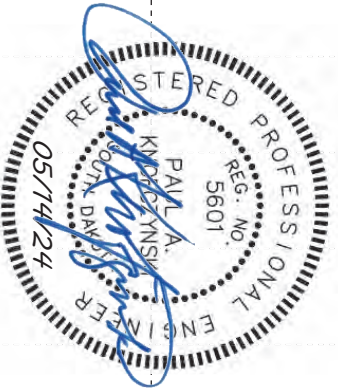
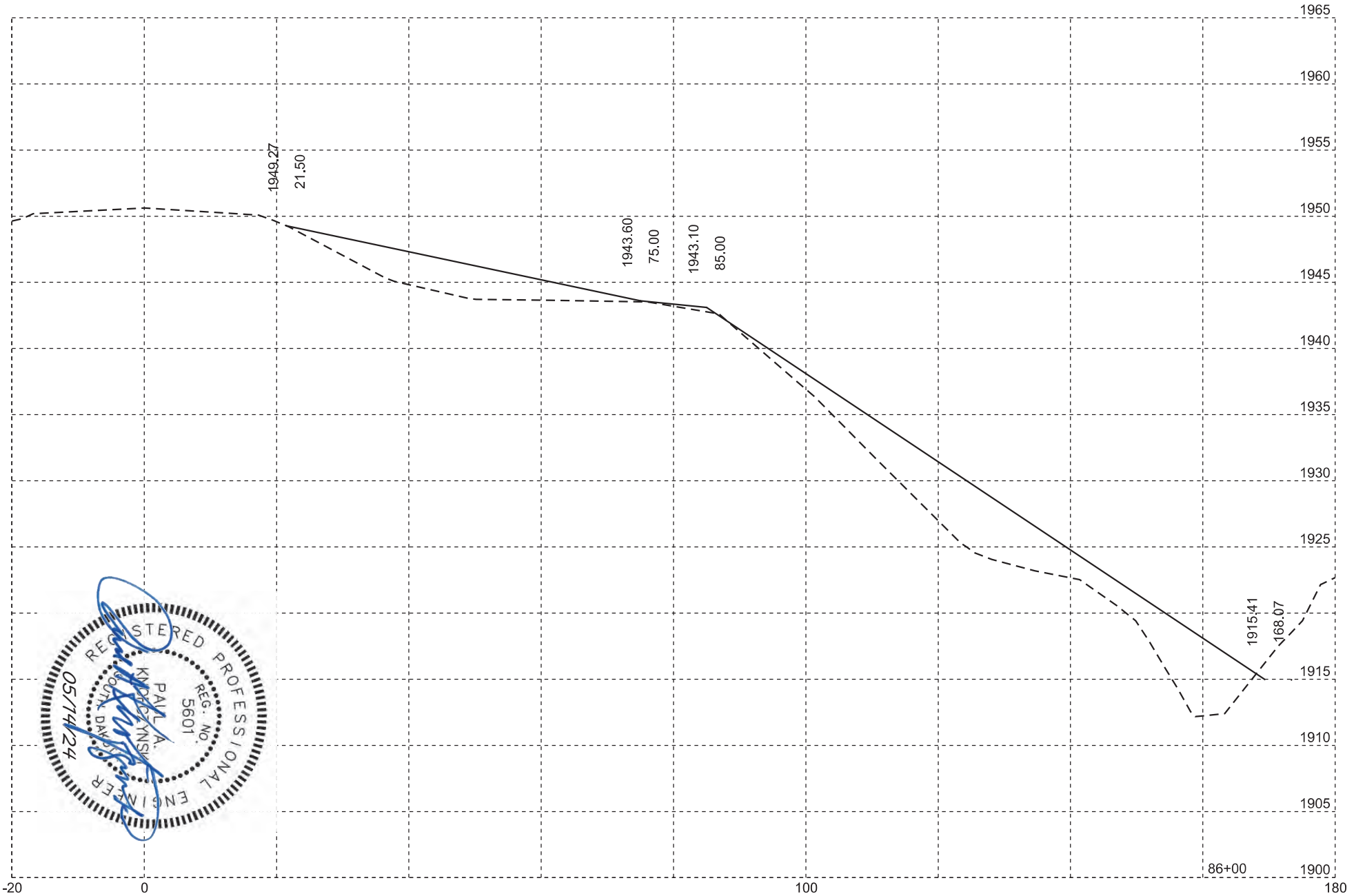
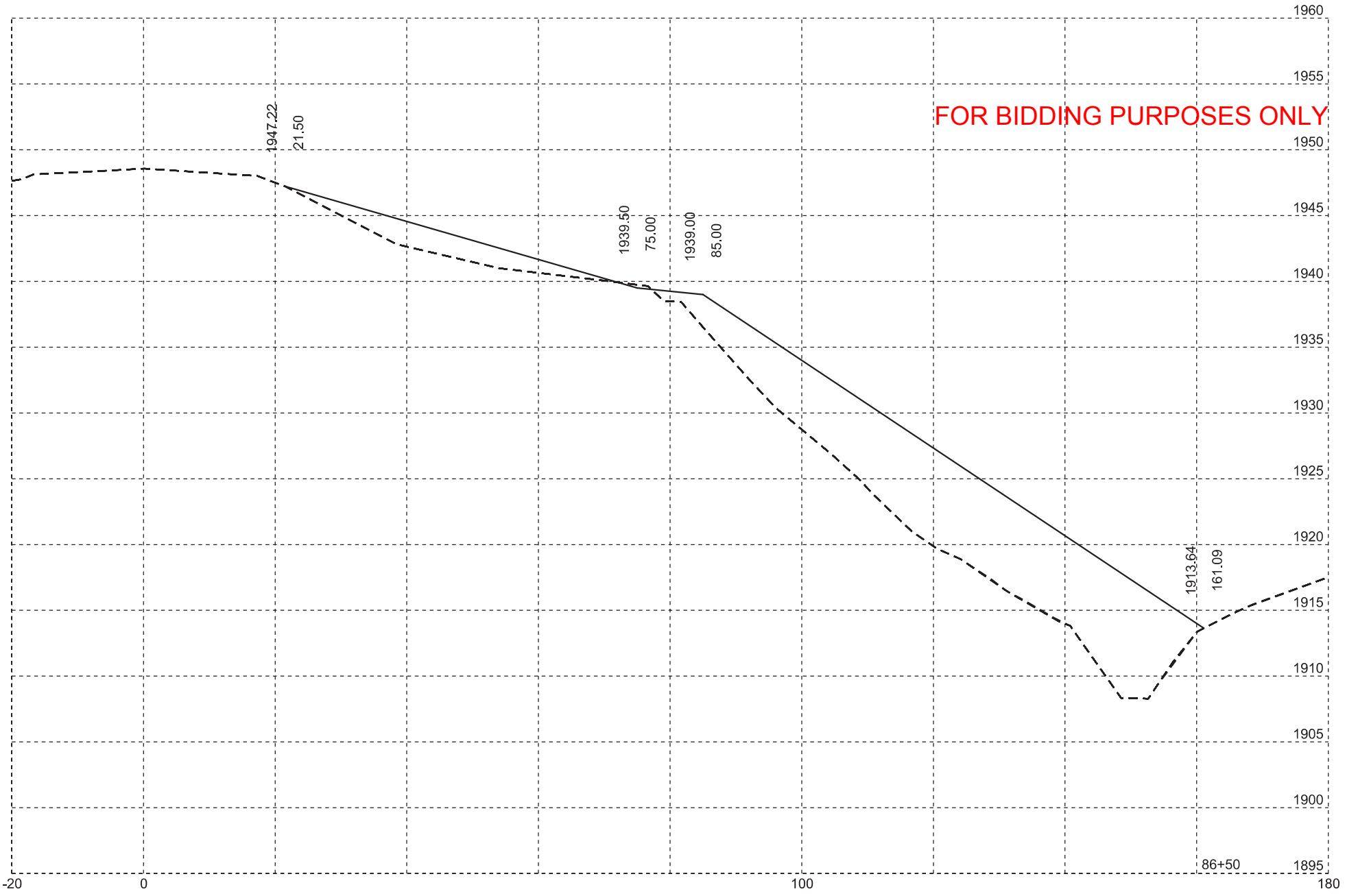
Published Date: 2024

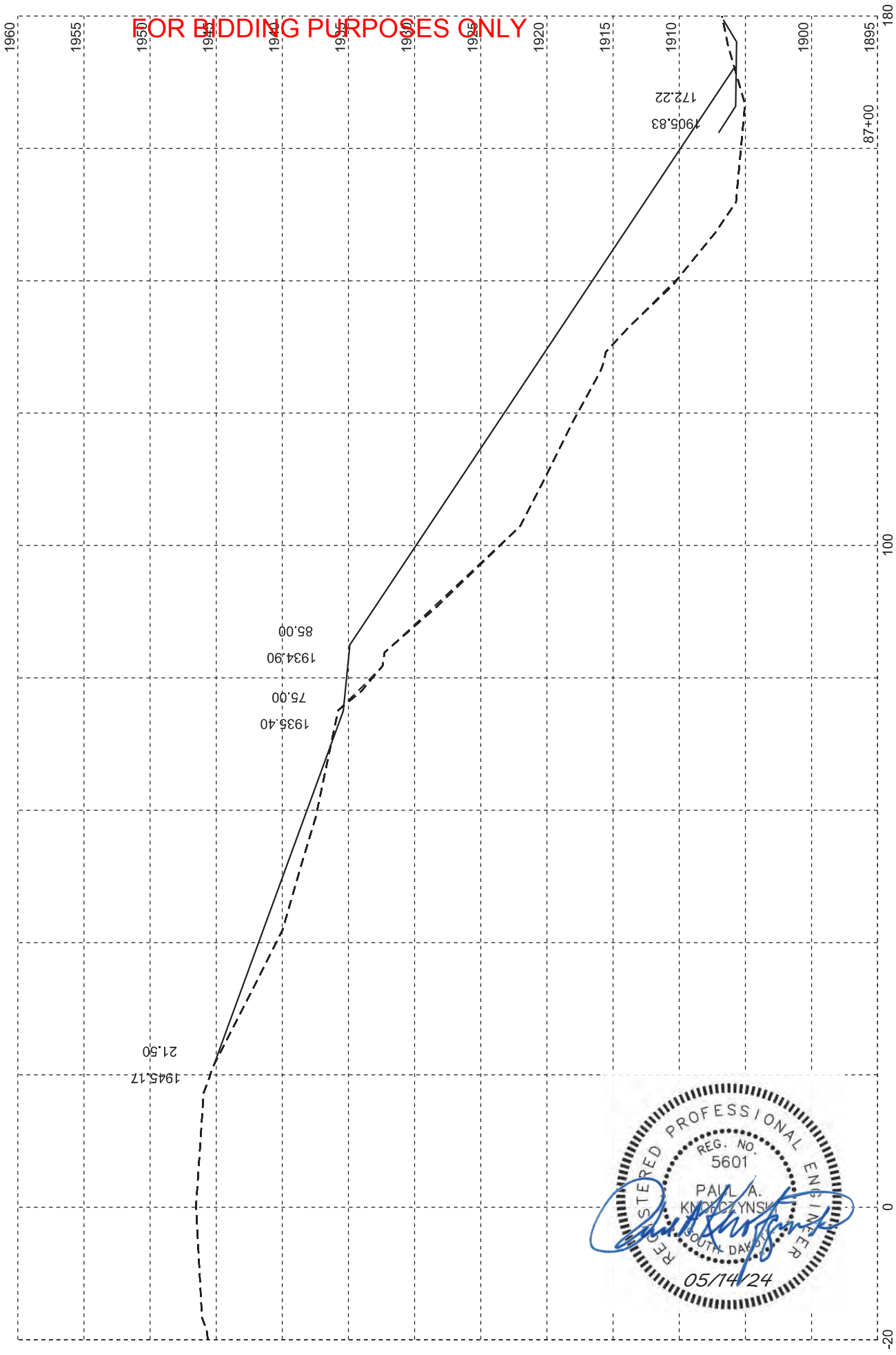
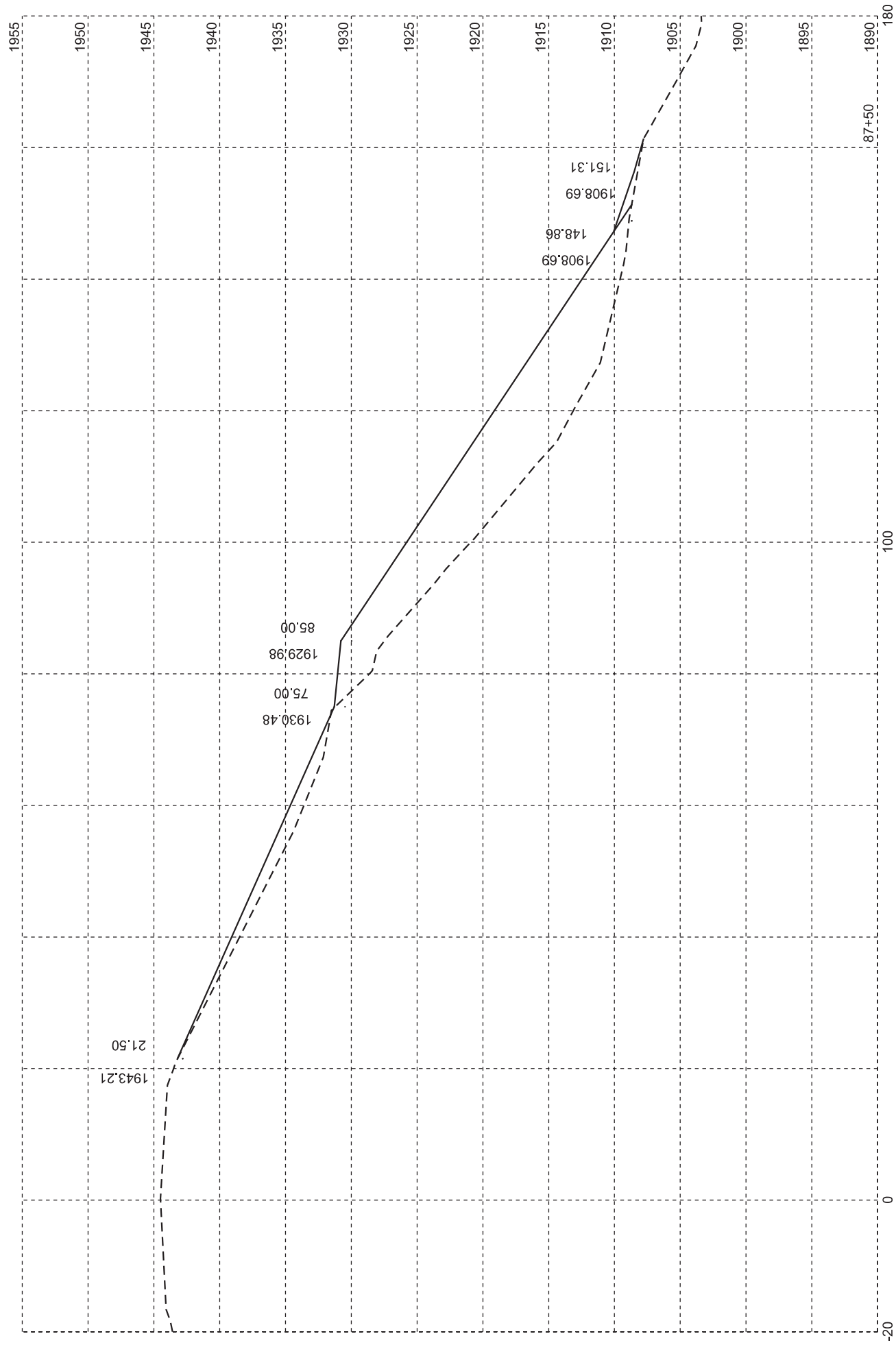


FOR BIDDING PURPOSES ONLY

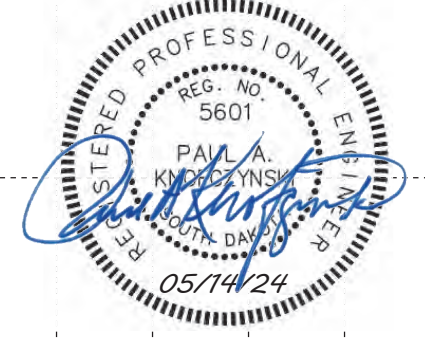


FOR BIDDING PURPOSES ONLY

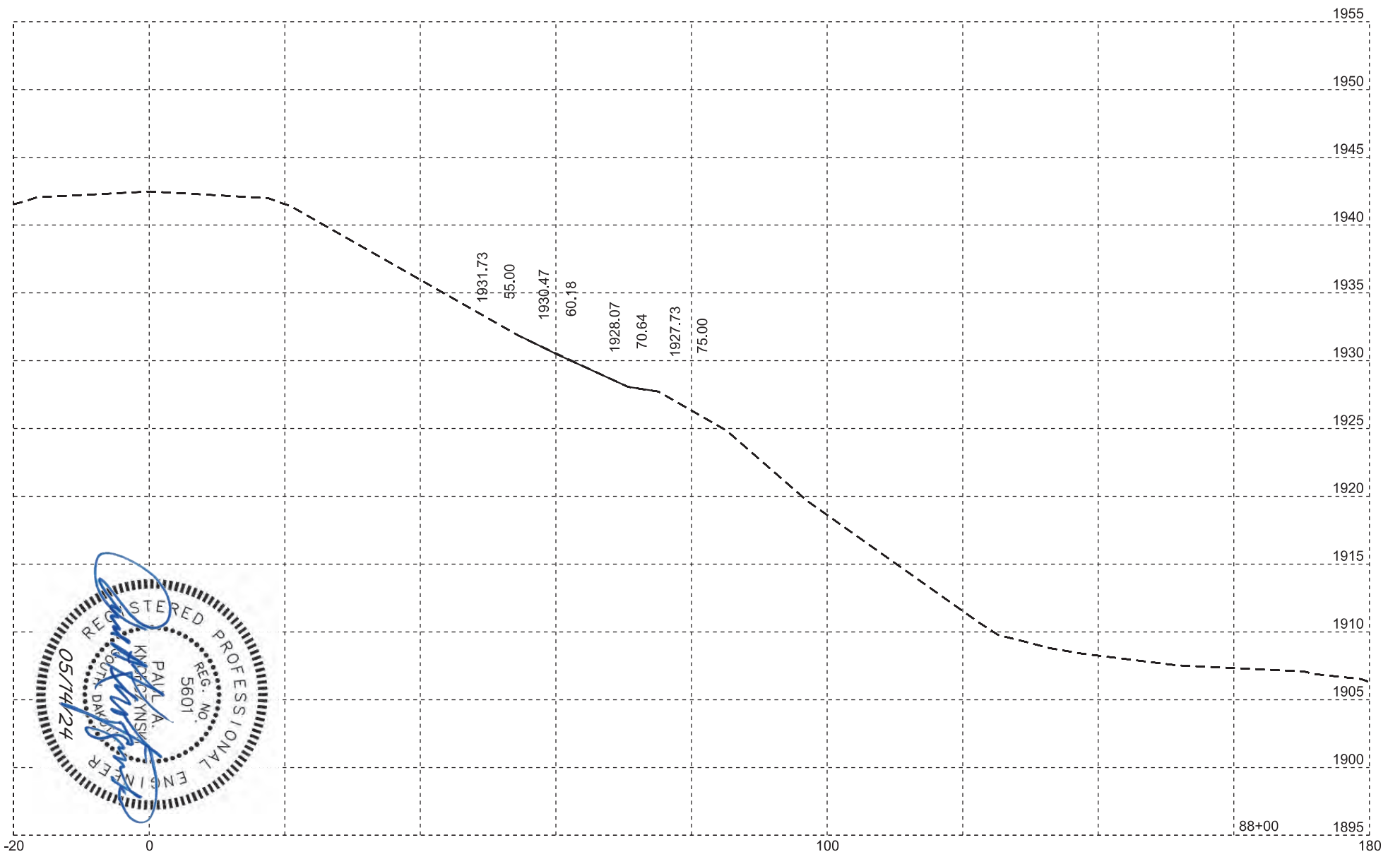
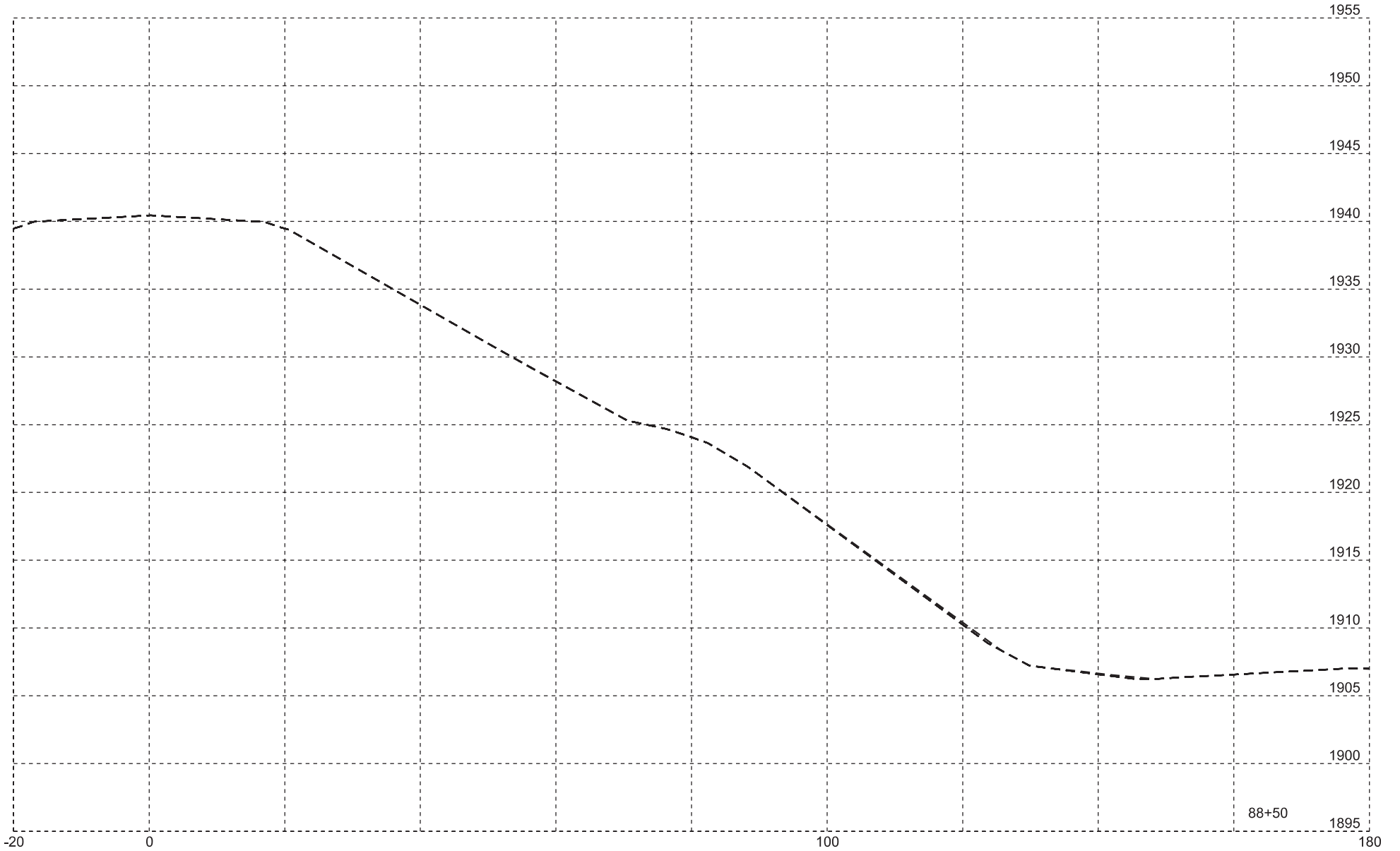




FOR BIDDING PURPOSES ONLY



FOR BIDDING PURPOSES ONLY

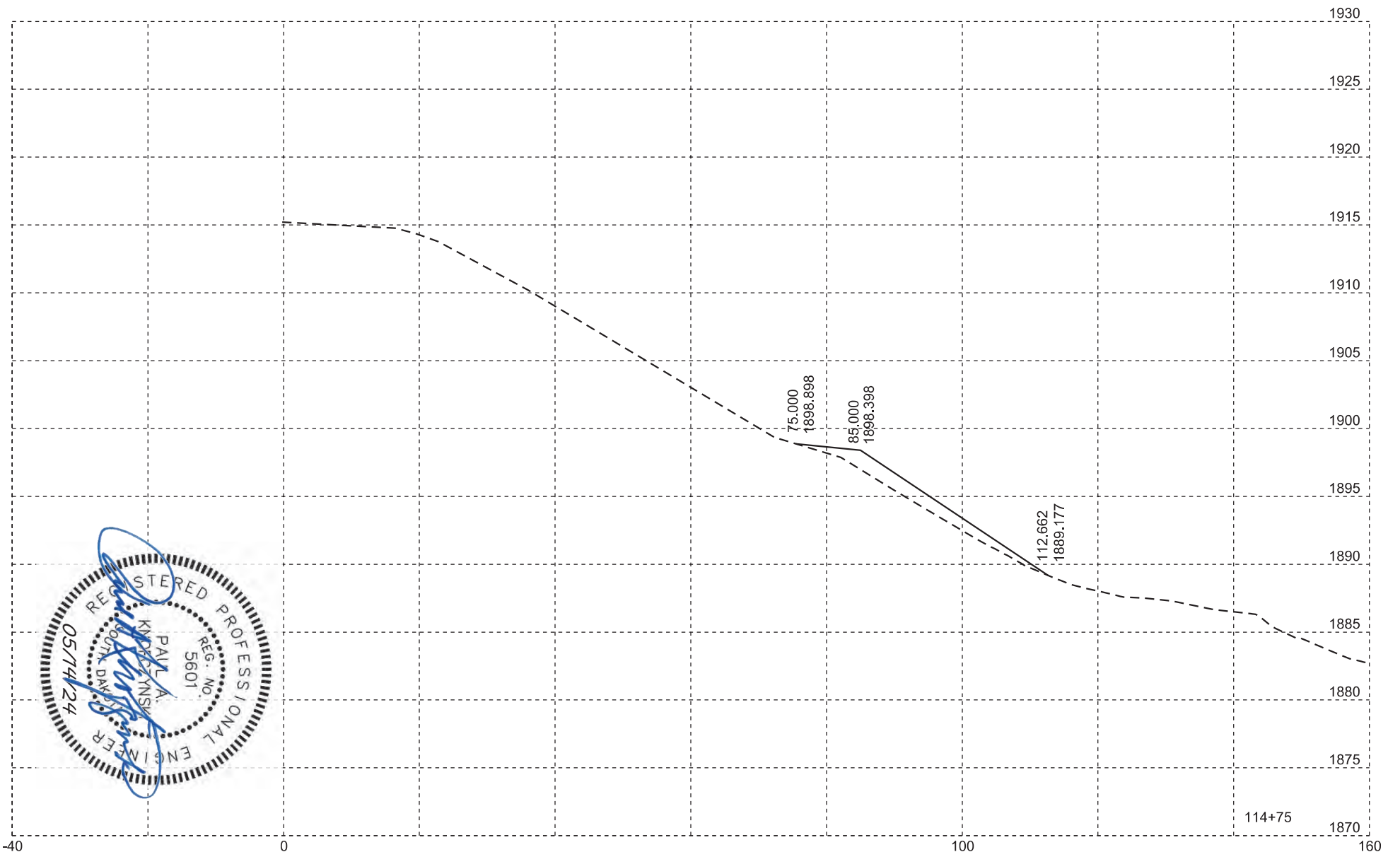
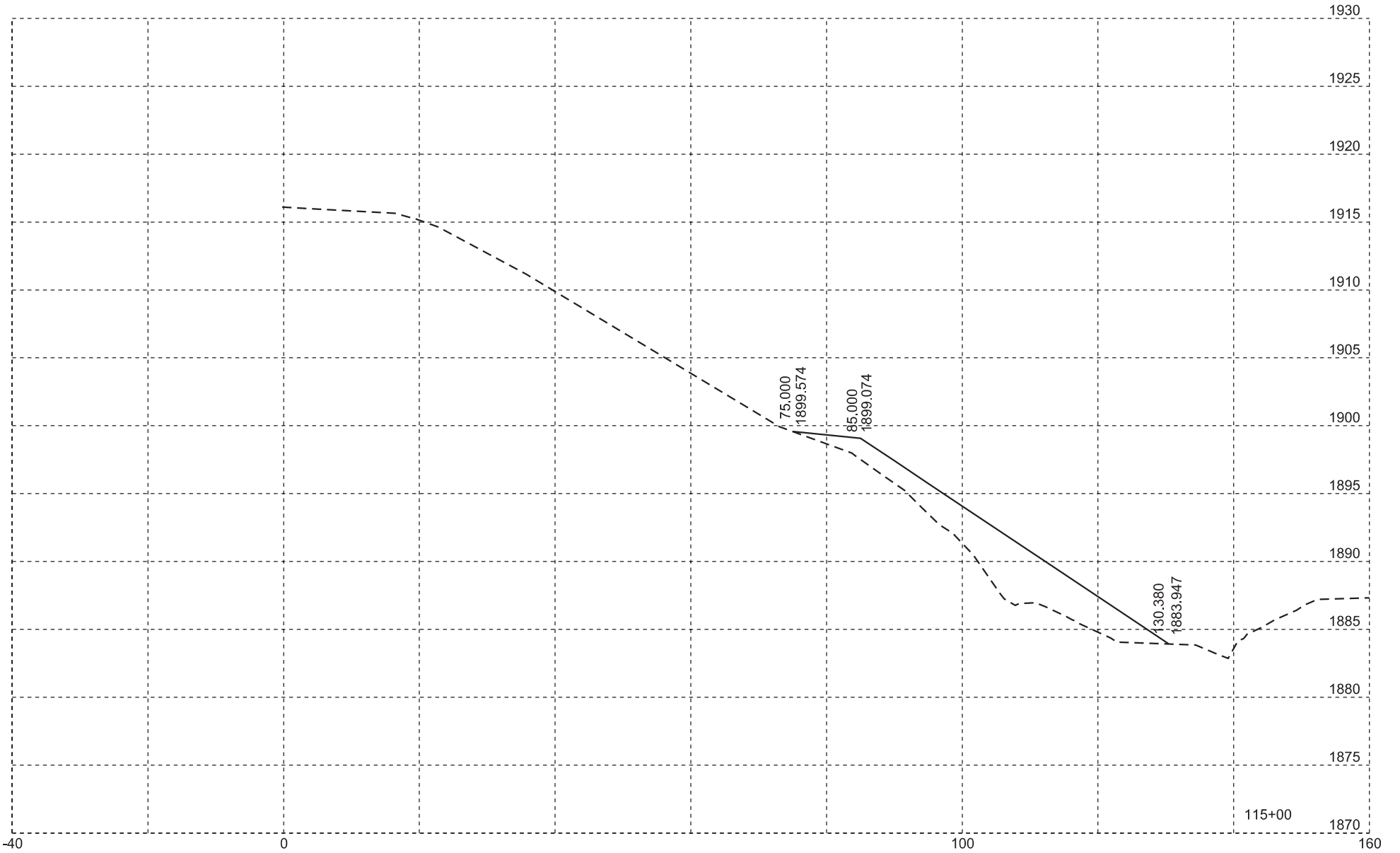


Plotting Date: 4/8/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	PT 0014(238)203	56	65



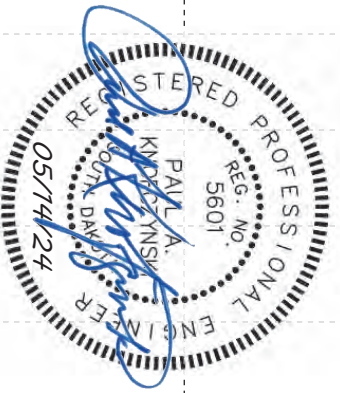
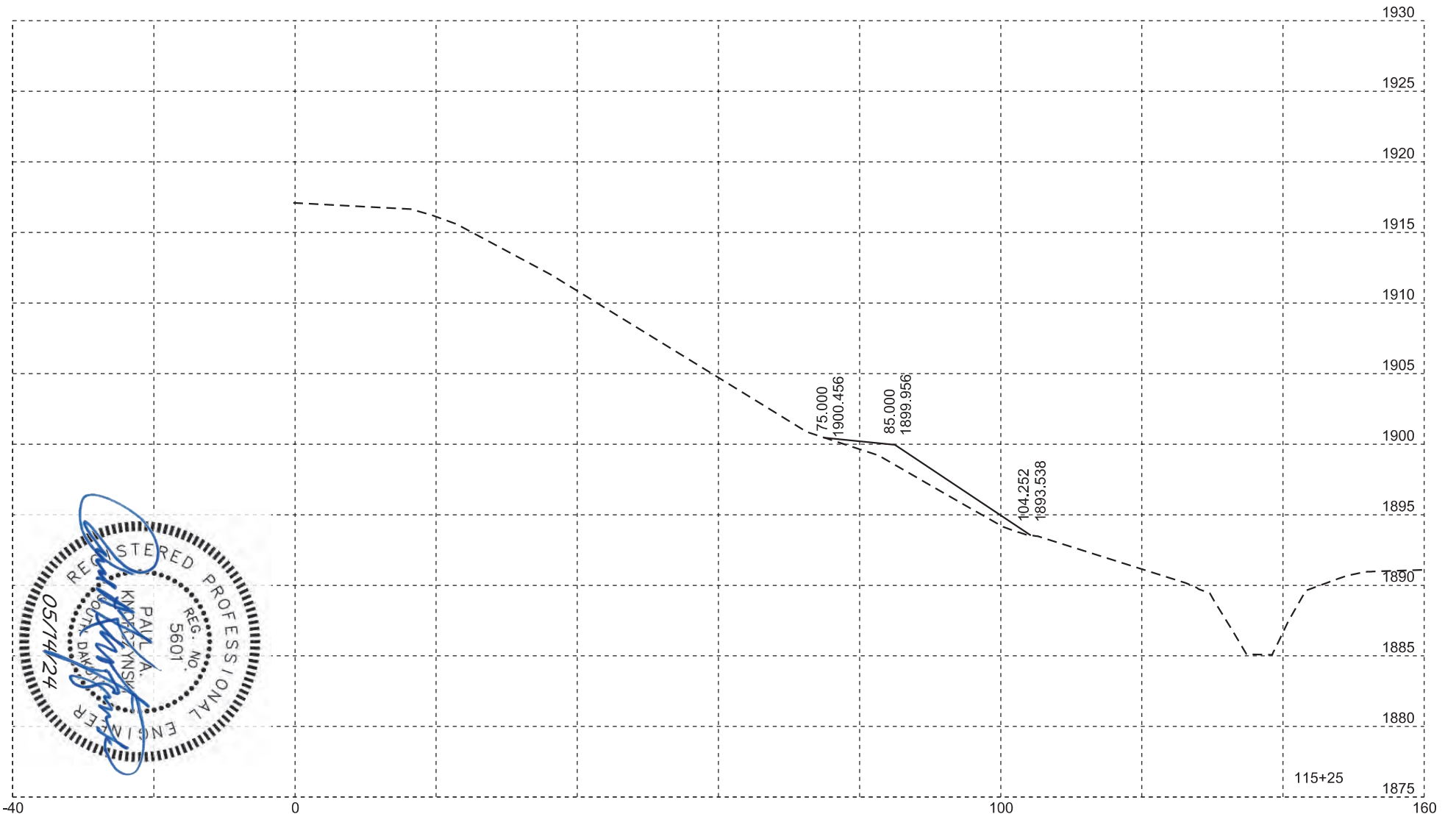
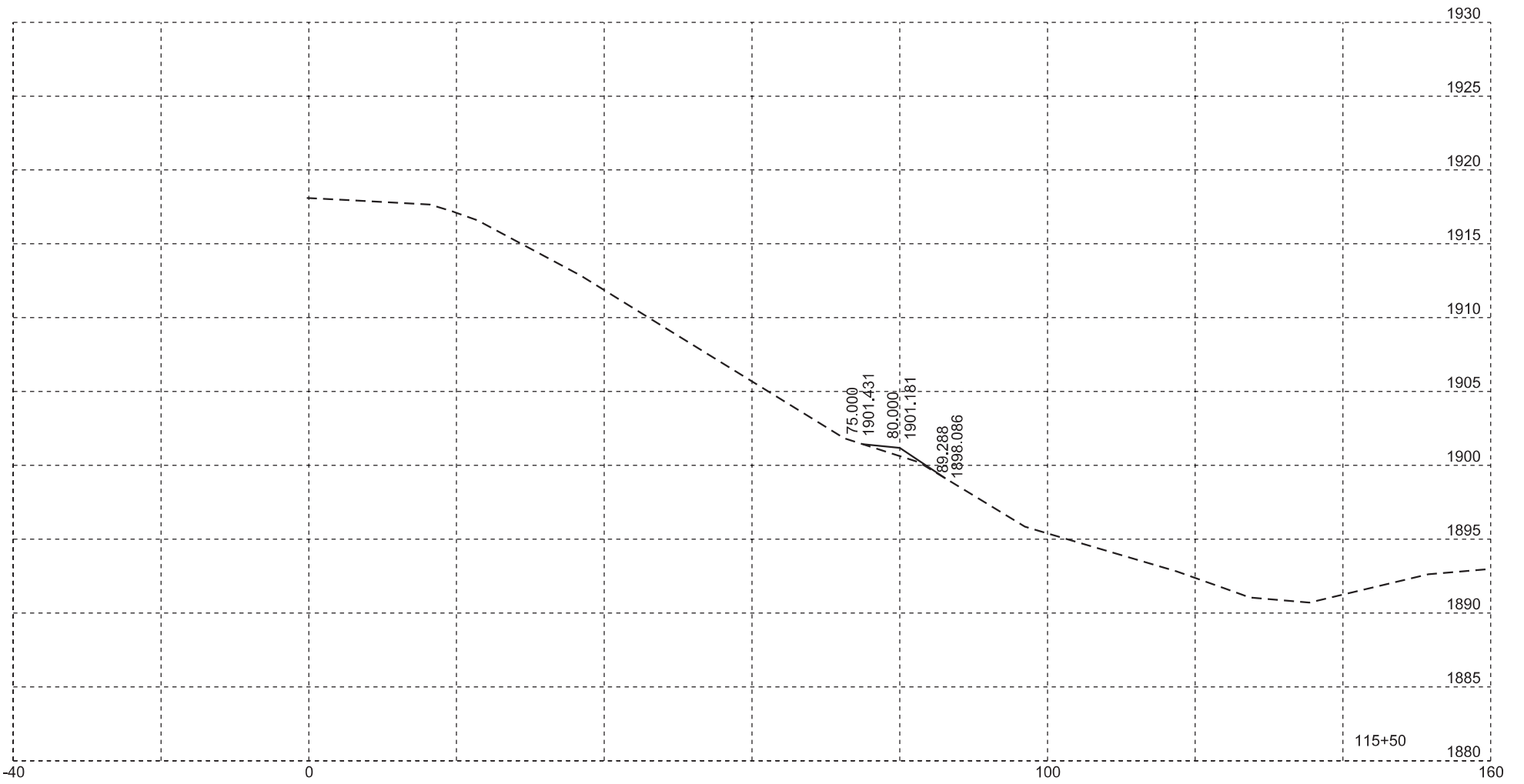
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Plotting Date: 4/8/2024

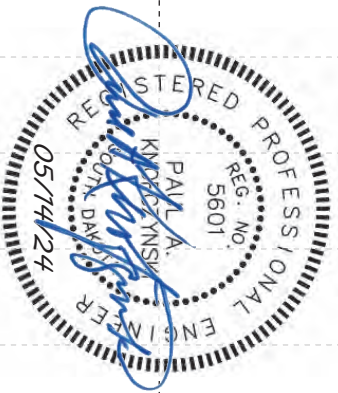
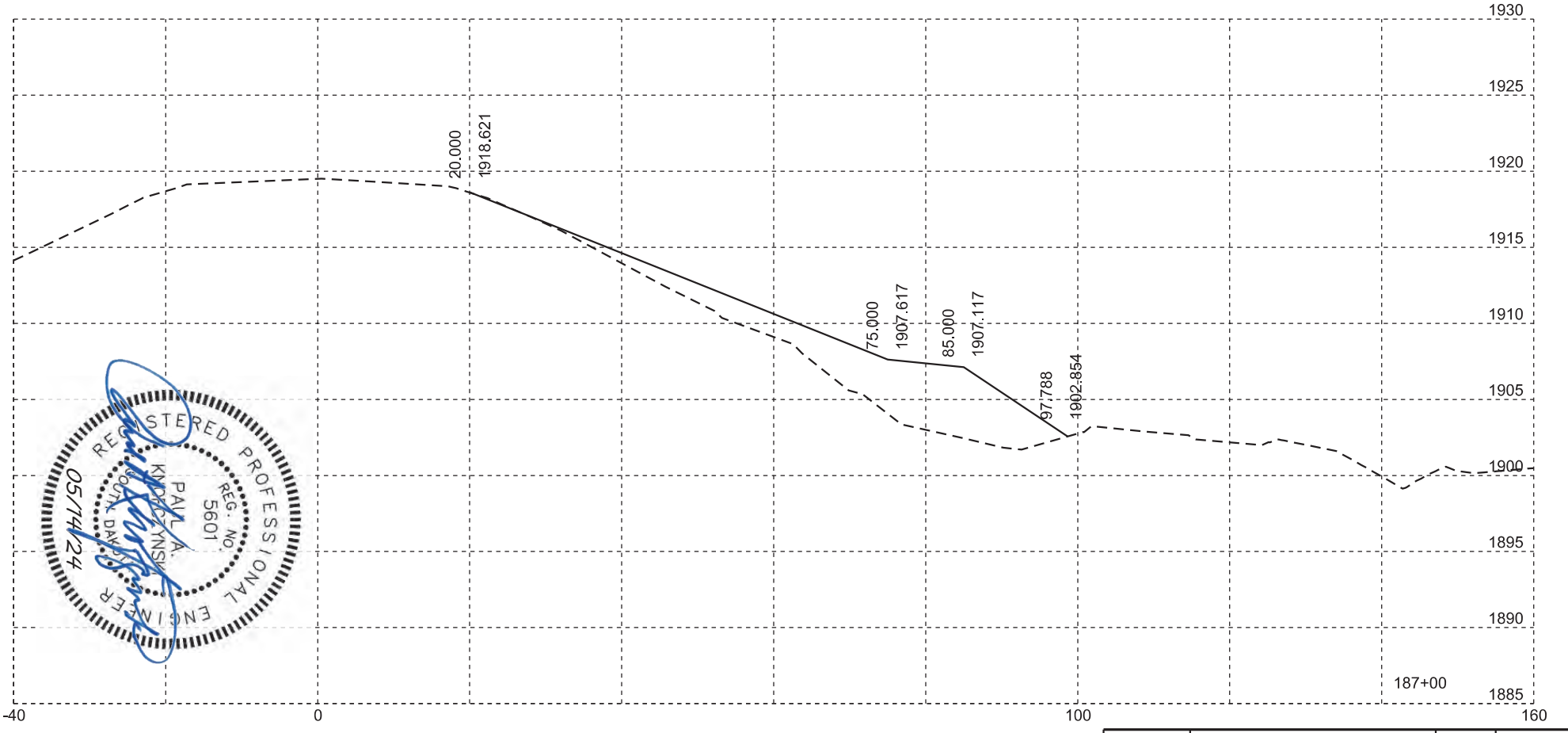
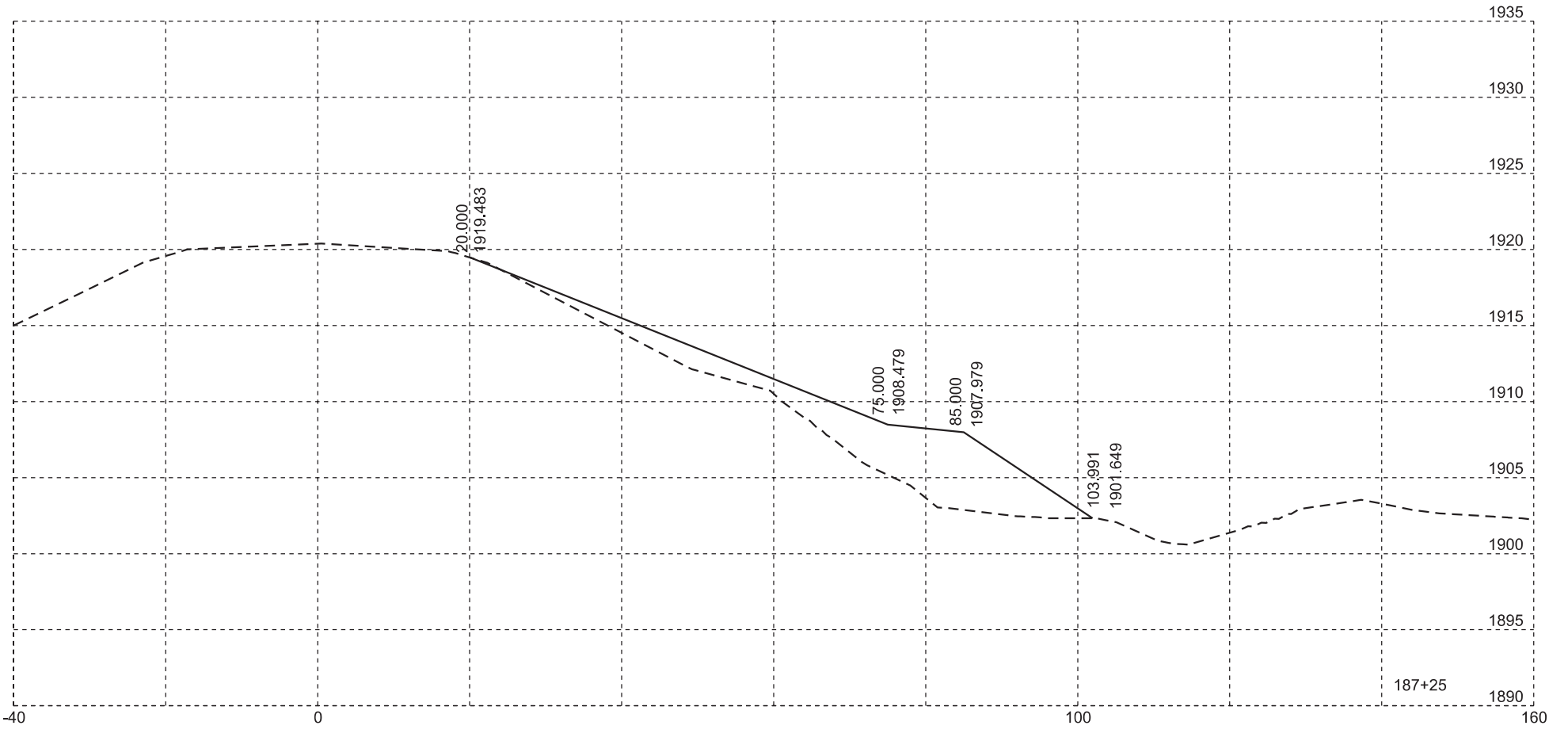
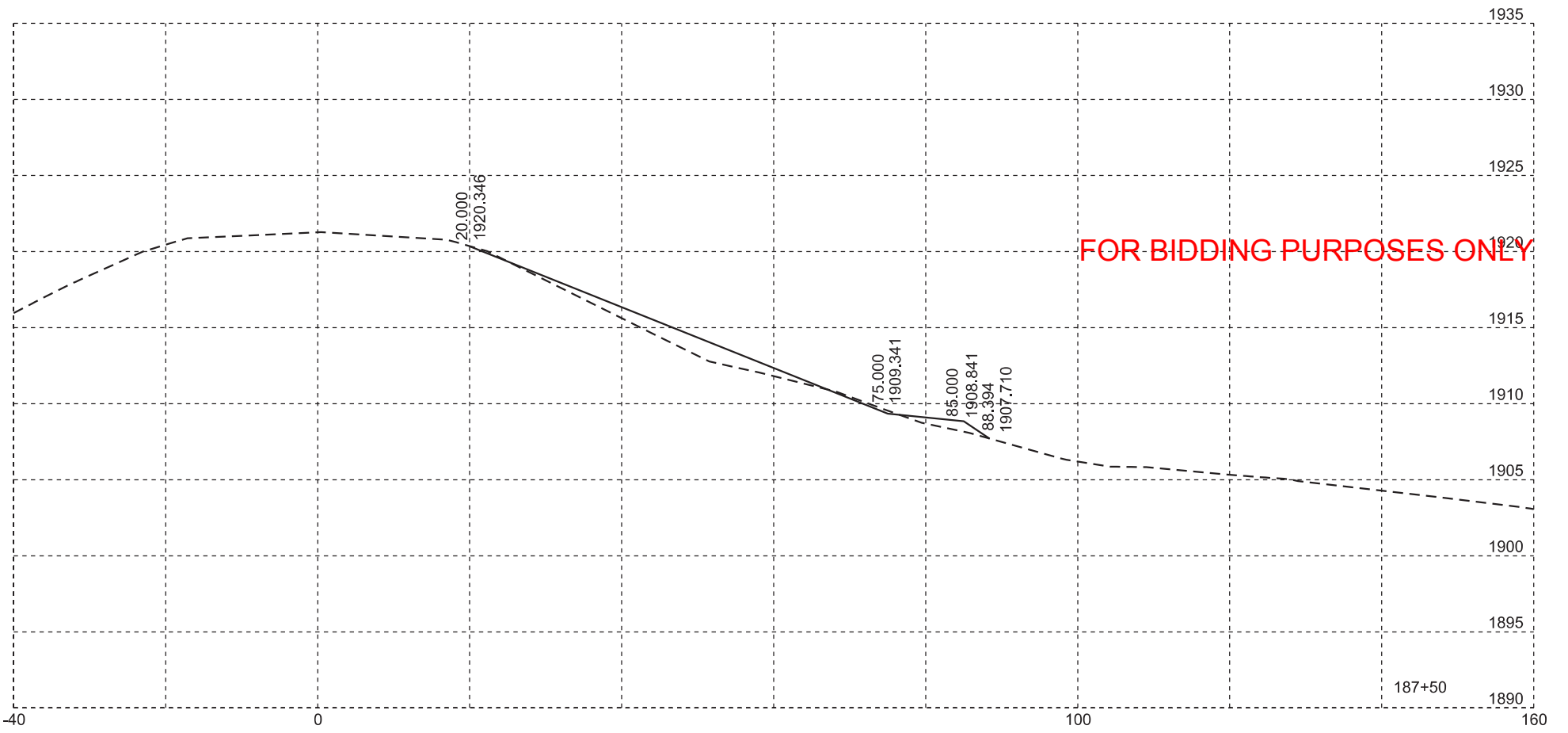
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	PT 0014(238)203	57	65

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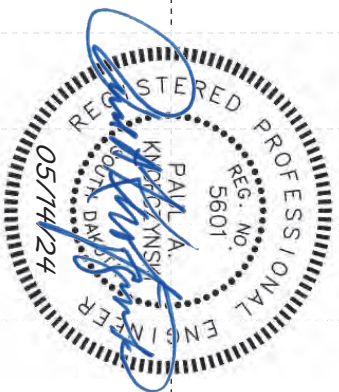
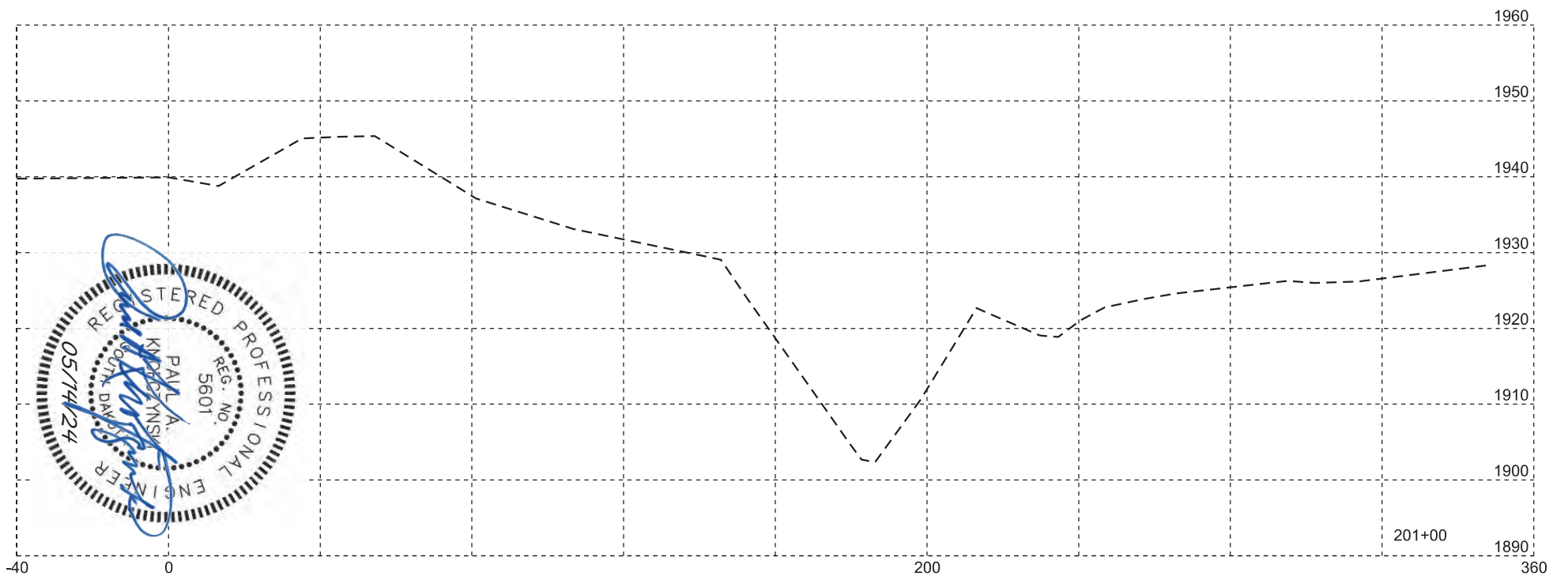
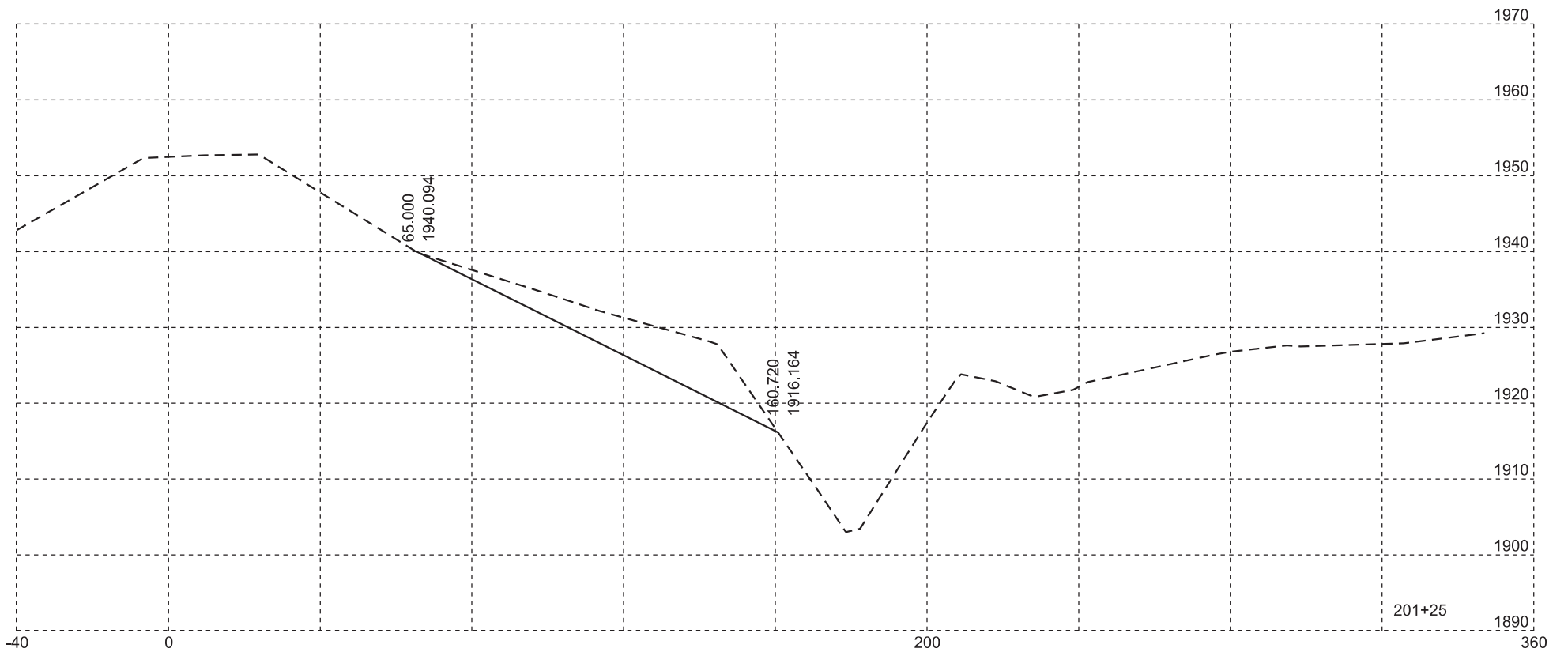
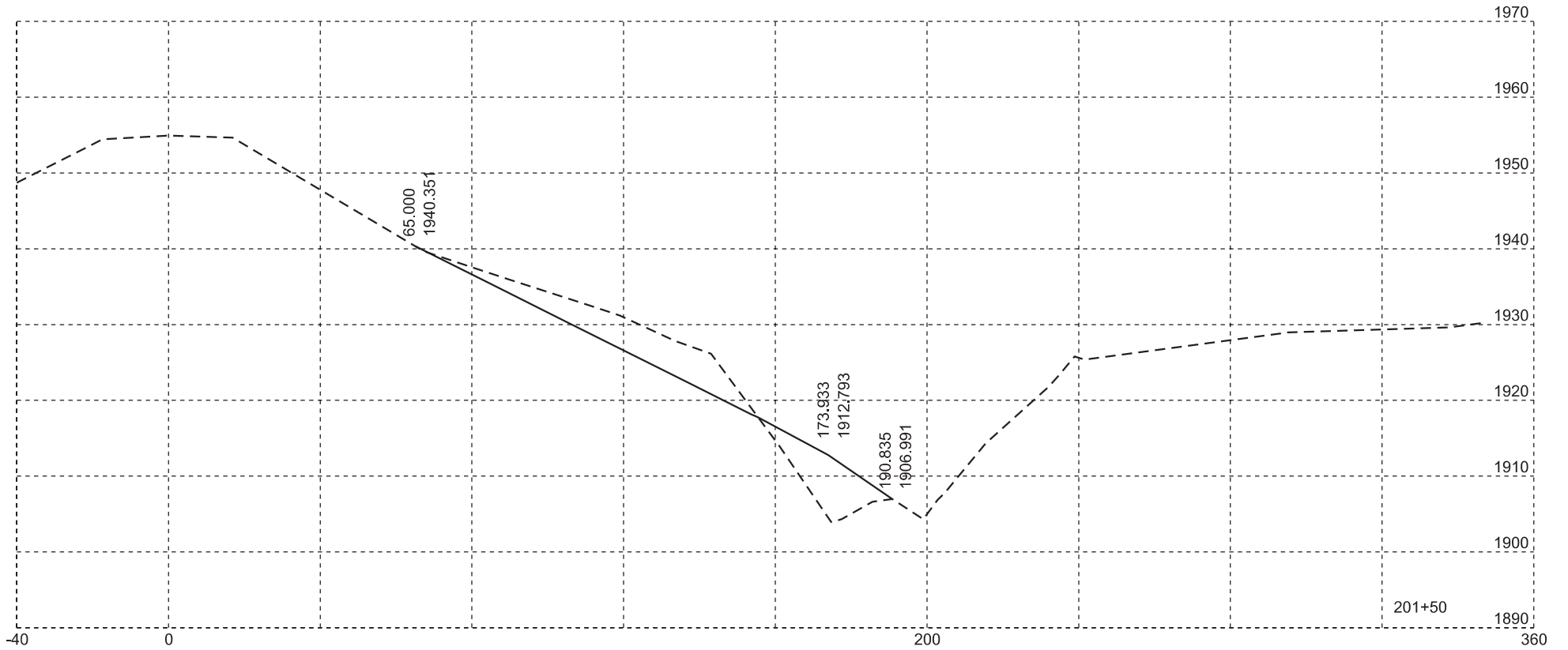


Plotting Date: 4/8/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	PT 0014(238)203	58	65

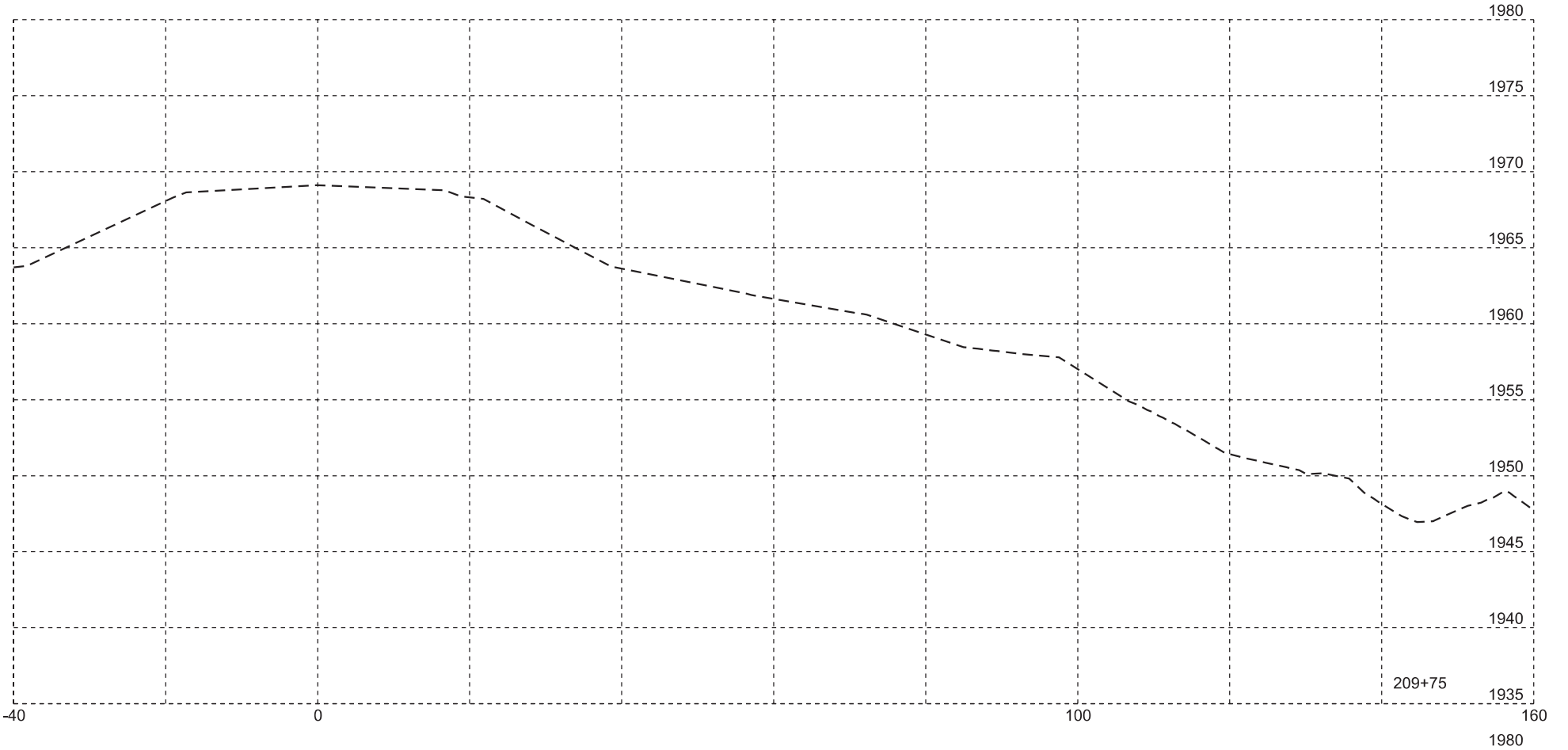
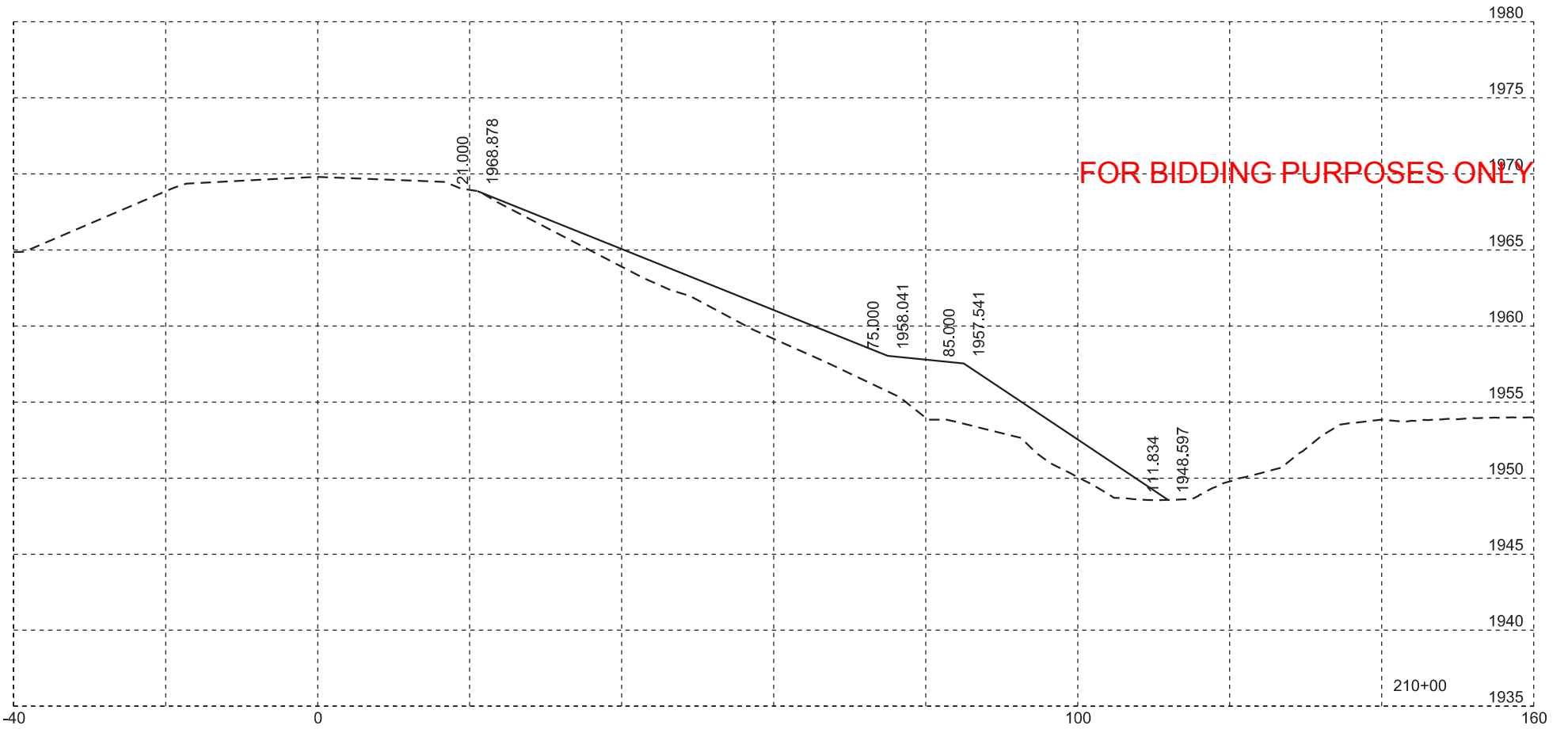


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Plotting Date: 4/8/2024

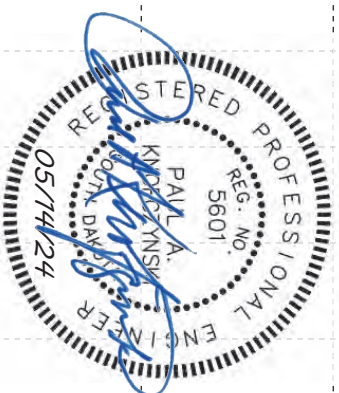
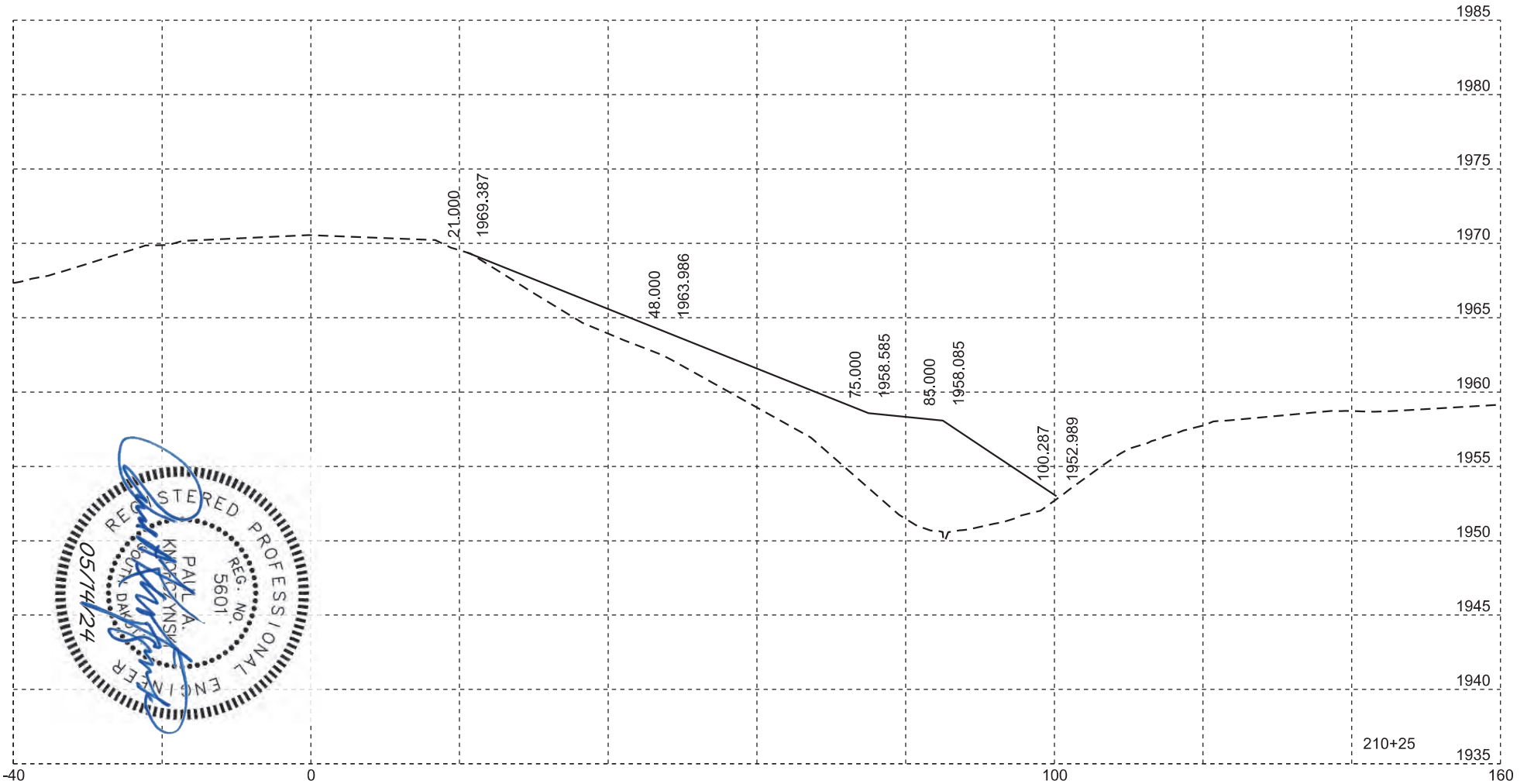
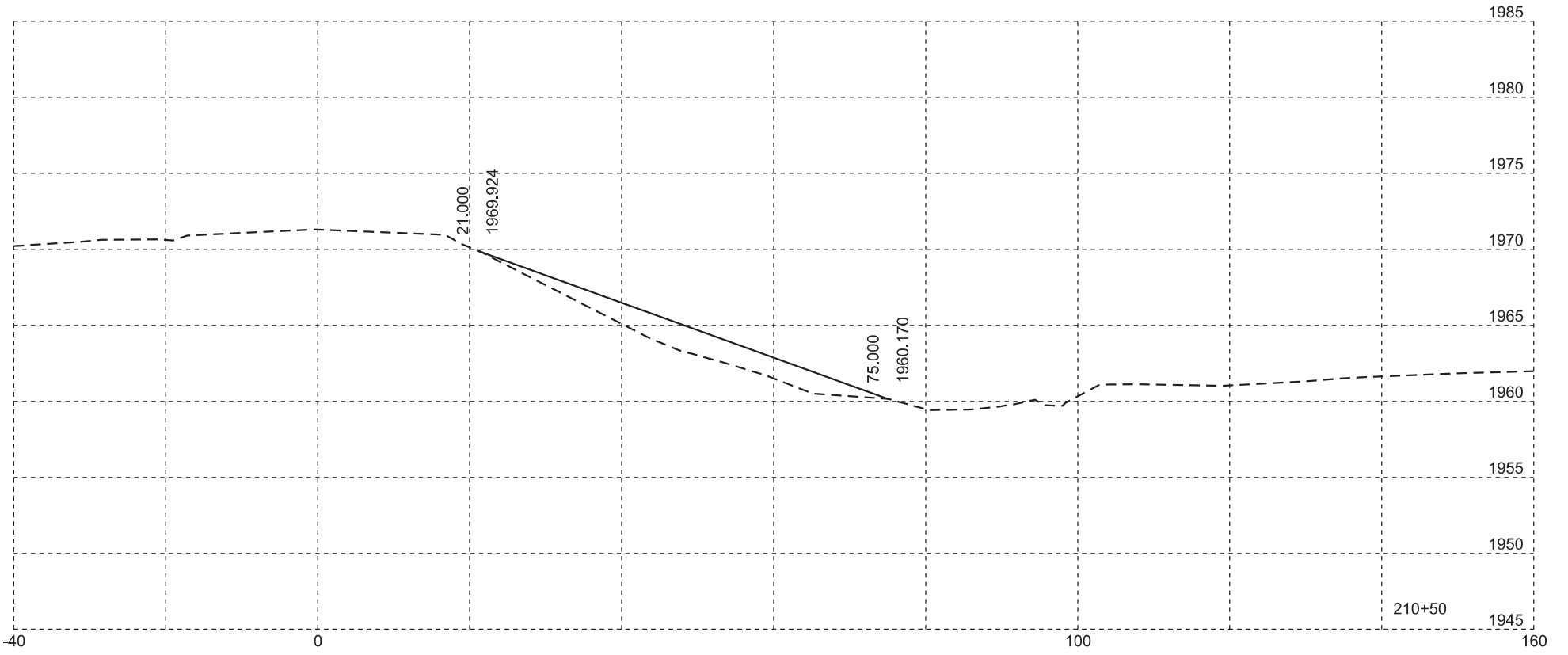
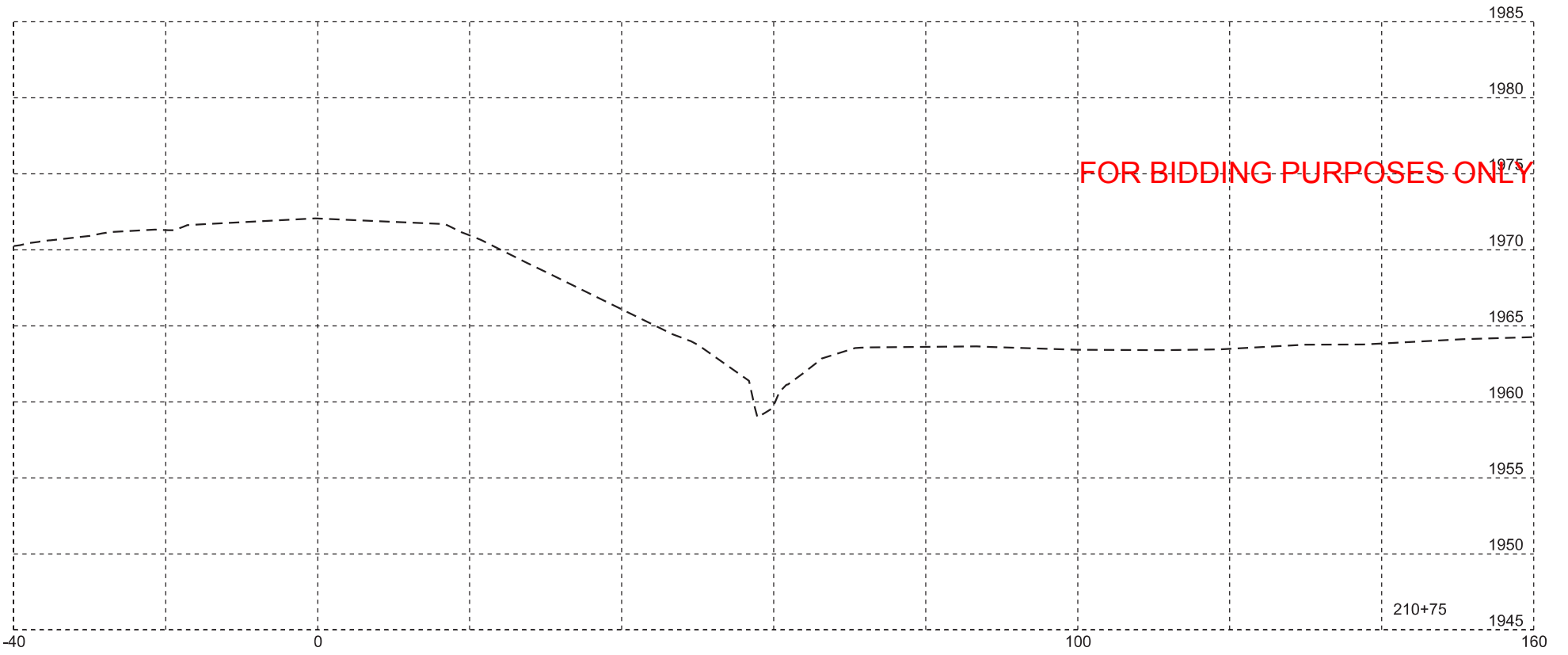
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	PT 0014(238)203	60	65



Plotting Date: 4/8/2024

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	PT 0014(238)203	61	65

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Plotting Date: 4/8/2024

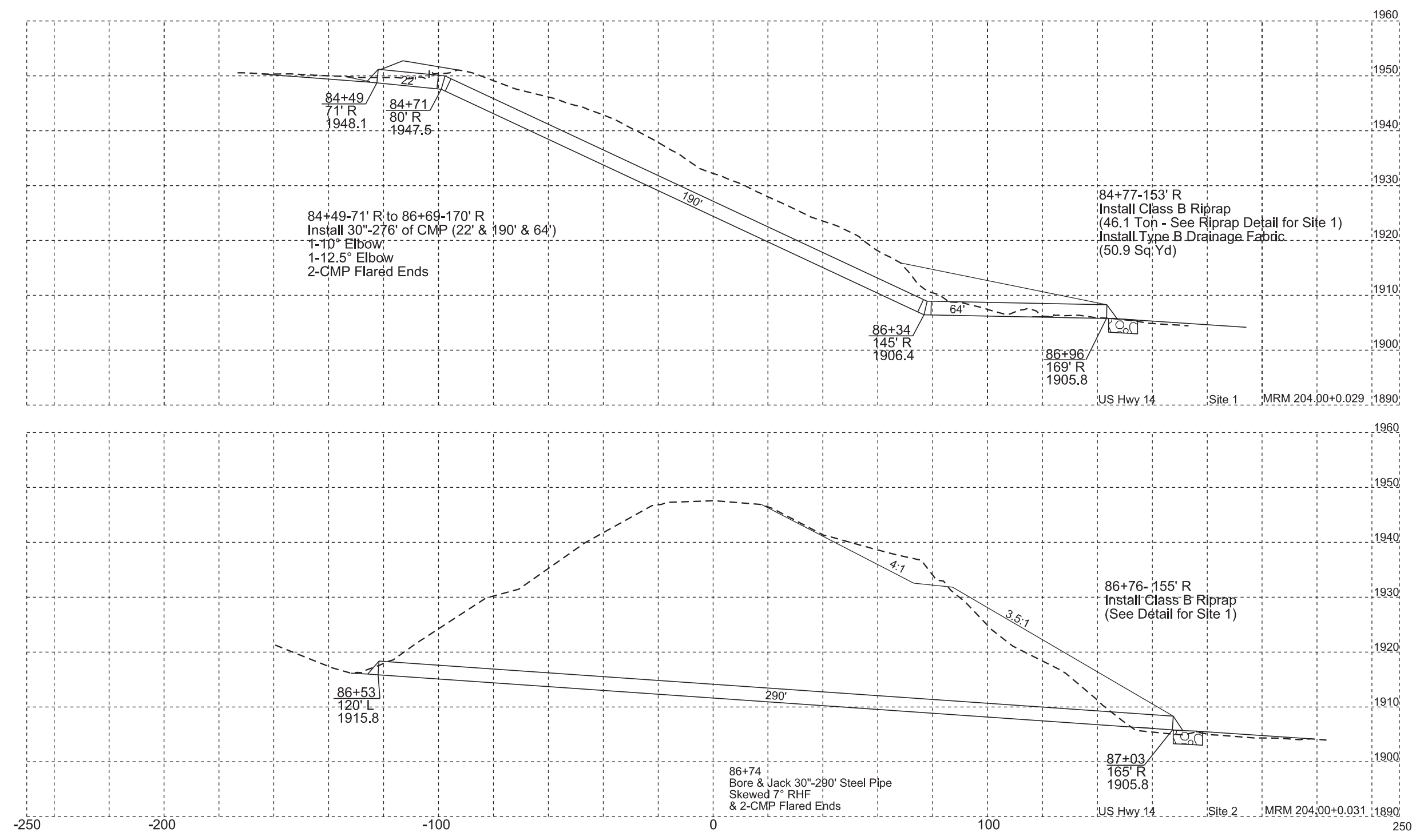
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	PT 0014(238)203	62	65

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STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	PT 0014(238)203	63	65

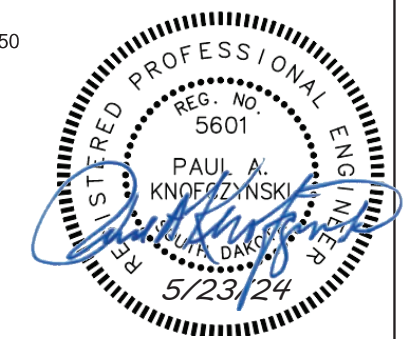
Plotting Date: 5/22/2024 Rev 5/22/24 E.JW

Plot Scale - 1:40

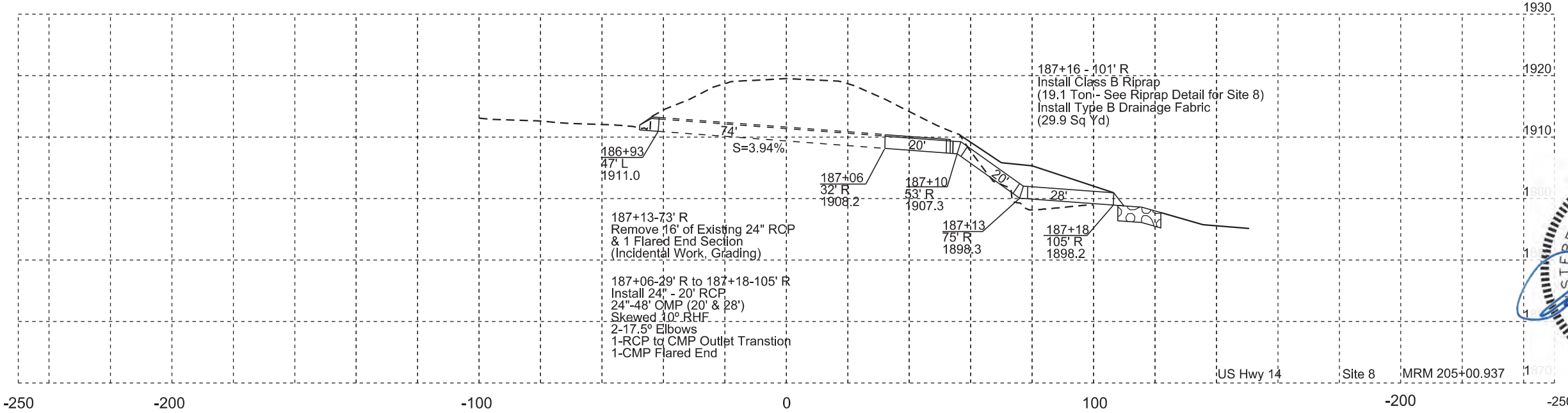
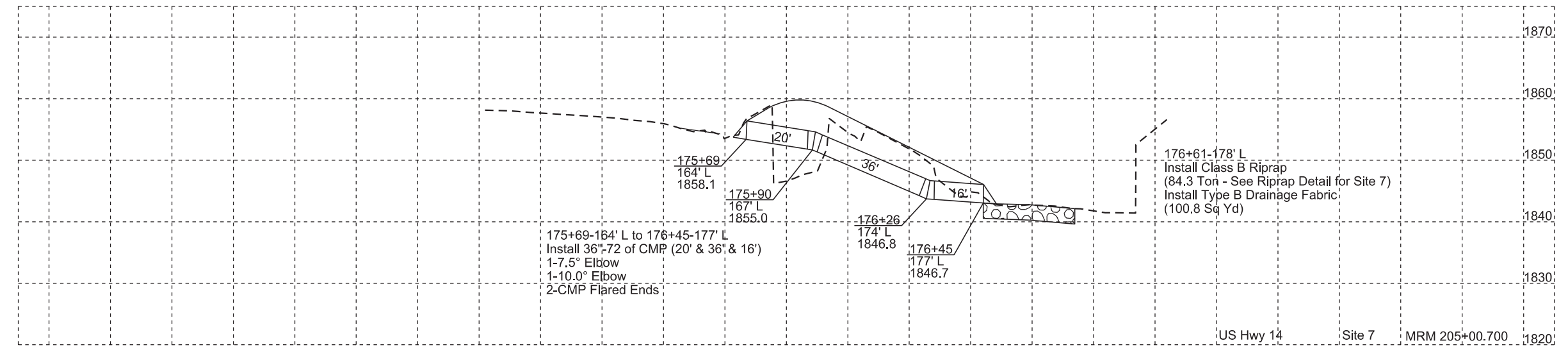
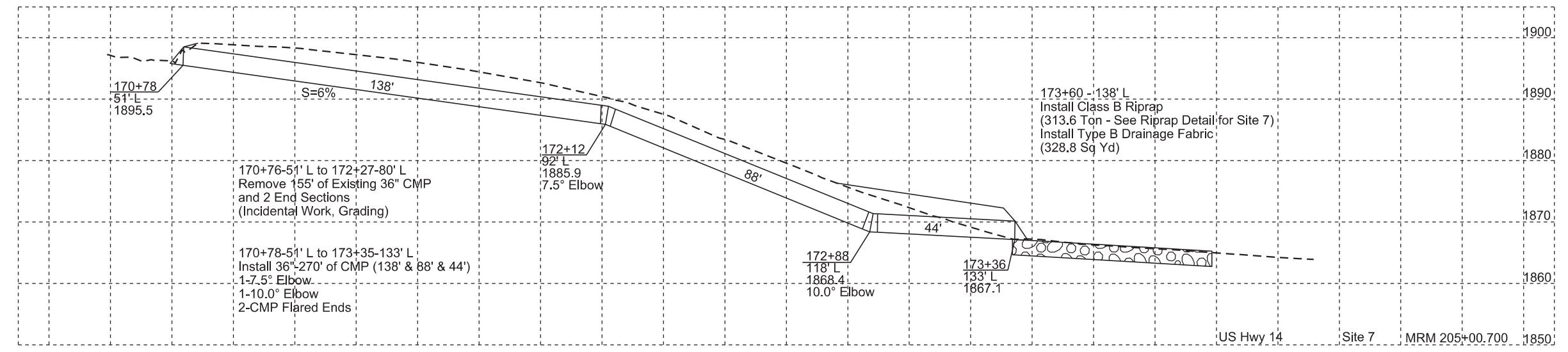


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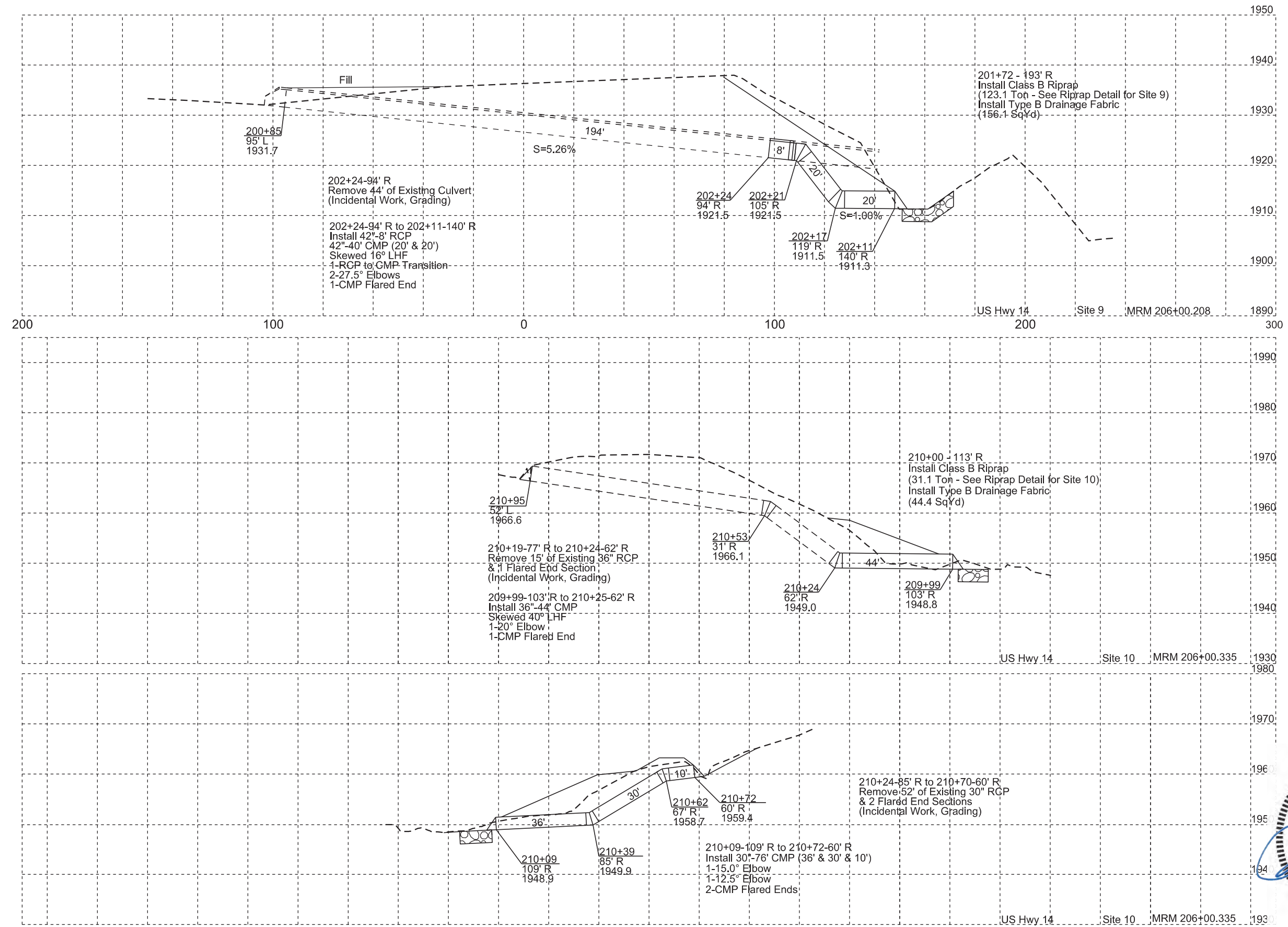
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STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	PT 0014(238)203	65	65

Plotting Date: 5/13/2024



Plot Scale - 1:40

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