STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	PH 0025(77)164 P 0020(124)363	1	109

Plotting Date: 01/07/2016

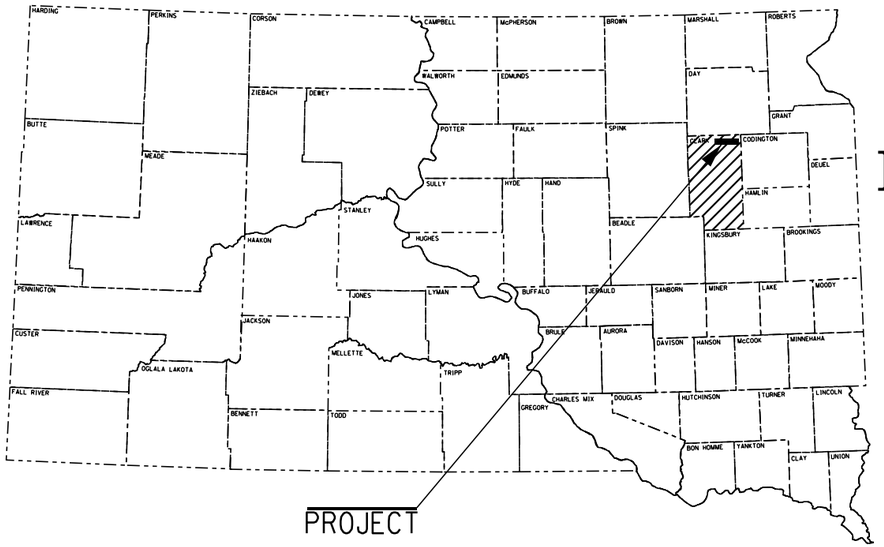
Revised 01/05/2016

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

PROJECT PH 0025(77)164 & P 0020(124)363
SD HIGHWAY 25 & 20
CLARK COUNTY

Grading, Asphalt Concrete
Resurfacing, Pipe Work, & ROW

PCN 04J6 & 025V

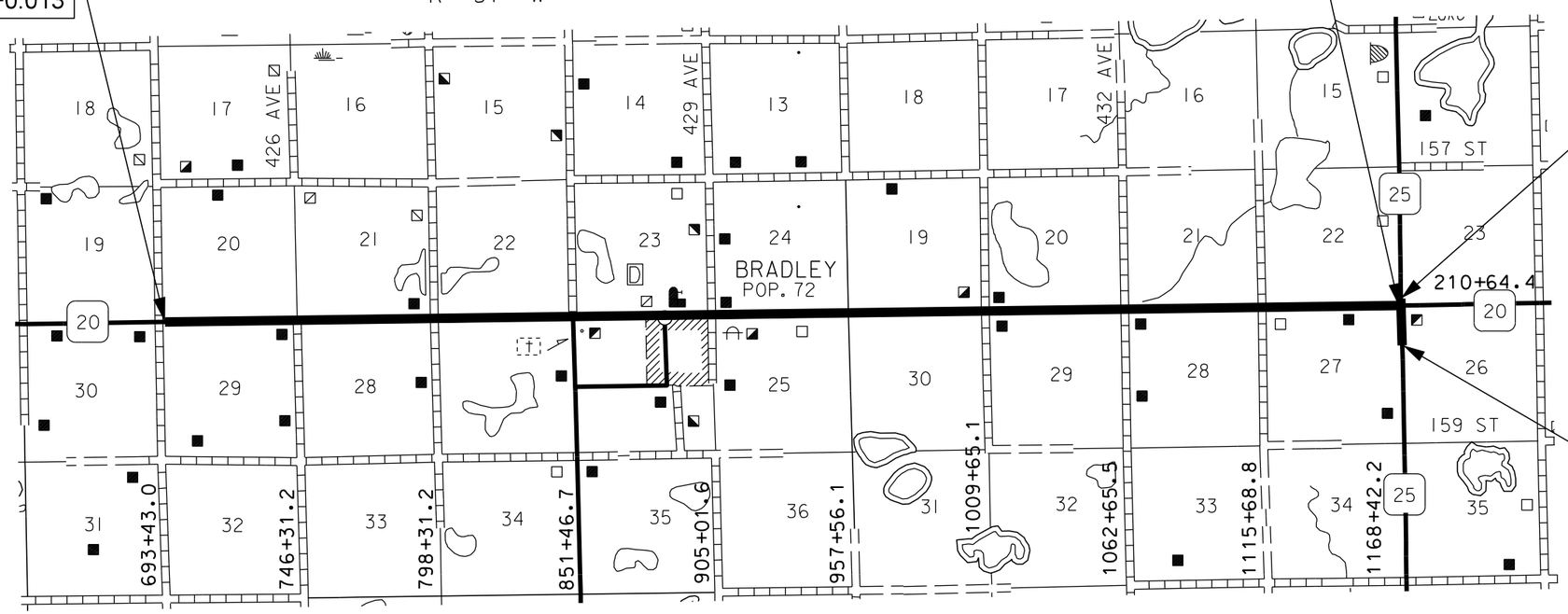


BEGIN PROJECT
P 0020(124)363
SD 20, PCN 025V
STA. 694+10
MRM 363.73+0.013

END PROJECT
P 0020(124)363
SD 20, PCN 025V
STA. 1167+09.20
MRM 372.00+0.715

R 57 W

R 56 W



BEGIN PROJECT
PH 0025(77)164
SD 25, PCN 04J6
STA. 208+33.50
MRM 164.85+0.044

END PROJECT
PH 0025(77)164
SD 25, PCN 04J6
STA. 225+50
MRM 164.00+0.578

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SCALES

		RURAL
PLAN		1"=200'
PROFILE,	HORIZONTAL:	1"=200'
	VERTICAL:	1"=20'
CROSS SECTIONS	HORIZONTAL:	1"=40'
	VERTICAL:	1"=20'

STORM WATER PERMIT

Major Receiving Body of Water: Unnamed Streams & Lakes
Area Disturbed: 6.6 Acres
Total Project Area: 169 Acres
Approx. Begin Lat/Long: 45.094331, -97.718047

DESIGN DESIGNATION (SD 25)		DESIGN DESIGNATION (SD 20)	
ADT (2013)	440	ADT (2013)	611
ADT (2033)	576	ADT (2033)	799
DHV	63	DHV	88
D	51.0%	D	51.0%
T DHV	7.6%	T DHV	7.1%
T ADT	16.7%	T ADT	15.5%
V	70	V	65

	PH 0025(77)164, PCN 04J6		P 0020(124)363, PCN 025V	
GROSS LENGTH	1716.50 FEET	0.325 MILES	47299.20 FEET	8.958 MILES
LENGTH OF EXCEPTIONS	0.00 FEET	0.000 MILES	0.00 FEET	0.000 MILES
NET LENGTH	1716.50 FEET	0.325 MILES	47299.20 FEET	8.958 MILES

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PLOT SCALE - 1:5400

PLOT NAME - 1

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PLOTTED FROM - TRAB12222

ESTIMATE OF QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	PH 0025(77)164 P 0020(124)363	2	109

Plotting Date: 11/15/2015

PH 0025(77)164, PCN 04J6

	BID ITEM NUMBER	ITEM	QUANTITY	UNIT
	004E0010	Blading	6	Hour
	009E0010	Mobilization	Lump Sum	LS
	110E0130	Remove Traffic Sign	6	Each
	110E0600	Remove Fence	1,127	Ft
	110E1690	Remove Sediment	1.0	CuYd
	110E1700	Remove Silt Fence	10	Ft
	110E7150	Remove Sign for Reset	2	Each
	120E0010	Unclassified Excavation	28,912	CuYd
	120E0100	Unclassified Excavation, Digouts	16	CuYd
	120E2000	Undercutting	6,331	CuYd
	120E6100	Water for Embankment	19.8	MGal
	120E6200	Water for Granular Material	86.4	MGal
	205E0010	Dust Control Chloride	10,110	Lb
	230E0010	Placing Topsoil	2,530	CuYd
	250E0020	Incidental Work, Grading	Lump Sum	LS
	260E1010	Base Course	293.0	Ton
	260E1030	Base Course, Salvaged	6,217.3	Ton
	270E0040	Salvage and Stockpile Asphalt Mix and Granular Base Material	7,563.8	Ton
*	270E0210	Haul and Stockpile Granular Material	1,346.5	Ton
	320E0007	PG 64-28 Asphalt Binder	107.2	Ton
	320E1002	Class Q2 Hot Mixed Asphalt Concrete	1,865.2	Ton
	320E4000	Hydrated Lime	18.5	Ton
	320E7008	Grind 8" Rumble Strip or Stripe in Asphalt Concrete	0.7	Mile
	330E0010	MC-70 Asphalt for Prime	10.9	Ton
	330E0100	SS-1h or CSS-1h Asphalt for Tack	3.9	Ton
	330E0210	SS-1h or CSS-1h Asphalt for Flush Seal	1.9	Ton
	330E1000	Blotting Sand for Prime	25.6	Ton
	330E2000	Sand for Flush Seal	19.9	Ton
	421E0100	Pipe Culvert Undercut	56	CuYd
	450E0142	24" RCP Class 2, Furnish	106	Ft
	450E0150	24" RCP, Install	106	Ft
	450E0162	30" RCP Class 2, Furnish	84	Ft
	450E0170	30" RCP, Install	84	Ft
	450E2200	24" RCP Sloped End, Furnish	2	Each
	450E2201	24" RCP Sloped End, Install	2	Each
	450E2204	30" RCP Sloped End, Furnish	2	Each
	450E2205	30" RCP Sloped End, Install	2	Each
	450E4759	18" CMP 16 Gauge, Furnish	60	Ft
	450E4760	18" CMP, Install	60	Ft
	450E5406	18" CMP Safety End, Furnish	2	Each
	450E5407	18" CMP Safety End, Install	2	Each
	620E0020	Type 2 Right-of-Way Fence	512	Ft
	620E1020	2 Post Panel	2	Each
	632E1320	2.0"x2.0" Perforated Tube Post	107.0	Ft
	632E1340	2.5"x2.5" Perforated Tube Post	30.0	Ft
	632E2510	Type 2 Object Marker Back to Back	4	Each
	632E3203	Flat Aluminum Sign, Nonremovable Copy High Intensity	83.3	SqFt
	632E3205	Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity	5.6	SqFt
	632E3500	Reset Sign	2	Each
	633E1300	Pavement Marking Paint, White	10	Gal
	633E1305	Pavement Marking Paint, Yellow	10	Gal
	634E0010	Flagging	300.0	Hour
	634E0020	Pilot Car	125.0	Hour
	634E0110	Traffic Control Signs	513	SqFt
	634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
	634E0630	Temporary Pavement Marking	1.3	Mile
	720E1015	Bank and Channel Protection Gabion	6.0	CuYd
	730E0212	Type G Permanent Seed Mixture	101	Lb
	731E0200	Fertilizing	1.95	Ton
	732E0100	Mulching	8.0	Ton
	734E0154	12" Diameter Erosion Control Wattle	100	Ft
	734E0604	High Flow Silt Fence	40	Ft
	734E0610	Mucking Silt Fence	3	CuYd
	734E0620	Repair Silt Fence	10	Ft
	900E0010	Refurbish Single Mailbox	1	Each

*** - Denotes Non-Participating**

PLOT SCALE - 1:200
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PLOT NAME - 1
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ESTIMATE OF QUANTITIES

Revised 01/05/2016

P 0020(124)363, PCN 025V

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
004E0020	Construction and Maintenance of Detour(s)	Lump Sum	LS
009E0010	Mobilization	Lump Sum	LS
110E0130	Remove Traffic Sign	49	Each
110E0510	Remove Pipe End Section	4	Each
110E0595	Remove Cattle Pass End Section	2	Each
110E1690	Remove Sediment	2.0	CuYd
110E1700	Remove Silt Fence	65	Ft
110E7150	Remove Sign for Reset	1	Each
110E7500	Remove Pipe for Reset	162	Ft
110E7510	Remove Pipe End Section for Reset	38	Each
120E0010	Unclassified Excavation	6,015	CuYd
120E0100	Unclassified Excavation, Digouts	448	CuYd
120E0600	Contractor Furnished Borrow Excavation	4,340	CuYd
230E0020	Placing Contractor Furnished Topsoil	105	CuYd
230E0100	Remove and Replace Topsoil	Lump Sum	LS
250E0020	Incidental Work, Grading	Lump Sum	LS
260E1010	Base Course	4,714.0	Ton
320E0007	PG 64-28 Asphalt Binder	1,405.5	Ton
320E1002	Class Q2 Hot Mixed Asphalt Concrete	24,425.2	Ton
320E1200	Asphalt Concrete Composite	558.0	Ton
320E4000	Hydrated Lime	244.5	Ton
320E7008	Grind 8" Rumble Strip or Stripe in Asphalt Concrete	17.9	Mile
330E0100	SS-1h or CSS-1h Asphalt for Tack	83.6	Ton
330E0210	SS-1h or CSS-1h Asphalt for Flush Seal	40.9	Ton
330E2000	Sand for Flush Seal	471.8	Ton
332E0010	Cold Milling Asphalt Concrete	513	SqYd
421E0100	Pipe Culvert Undercut	181	CuYd
450E0142	24" RCP Class 2, Furnish	546	Ft
450E0150	24" RCP, Install	546	Ft
450E0162	30" RCP Class 2, Furnish	92	Ft
450E0170	30" RCP, Install	92	Ft
450E0182	36" RCP Class 2, Furnish	70	Ft
450E0190	36" RCP, Install	70	Ft
450E2008	18" RCP Flared End, Furnish	3	Each
450E2009	18" RCP Flared End, Install	3	Each
450E2016	24" RCP Flared End, Furnish	4	Each
450E2017	24" RCP Flared End, Install	4	Each
450E2028	36" RCP Flared End, Furnish	2	Each
450E2029	36" RCP Flared End, Install	2	Each
450E2200	24" RCP Sloped End, Furnish	9	Each
450E2201	24" RCP Sloped End, Install	9	Each
450E2204	30" RCP Sloped End, Furnish	2	Each
450E2205	30" RCP Sloped End, Install	2	Each
450E5310	24" CMP Sloped End, Furnish	2	Each

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
450E5311	24" CMP Sloped End, Install	2	Each
450E8300	Culvert Joint Cleaning	66.0	Ft
450E8305	Repair Culvert Joint	66.0	Ft
450E8310	Chemical Grout Void Fill	70.0	Gal
* 450E8900	Cleanout Pipe Culvert	2	Each
450E9000	Reset Pipe	162	Ft
450E9001	Reset Pipe End Section	38	Each
464E0100	Controlled Density Fill	32.0	CuYd
600E0300	Type III Field Laboratory	1	Each
632E1320	2.0"x2.0" Perforated Tube Post	673.0	Ft
632E2510	Type 2 Object Marker Back to Back	70	Each
632E2520	Type 2 Object Marker	4	Each
632E3203	Flat Aluminum Sign, Nonremovable Copy High Intensity	136.8	SqFt
632E3205	Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity	228.5	SqFt
632E3500	Reset Sign	1	Each
633E0030	Cold Applied Plastic Pavement Marking, 24"	32	Ft
633E1300	Pavement Marking Paint, White	310	Gal
633E1305	Pavement Marking Paint, Yellow	115	Gal
633E5015	Grooving for Cold Applied Plastic Pavement Marking, 24"	32	Ft
634E0010	Flagging	380.0	Hour
634E0020	Pilot Car	145.0	Hour
634E0110	Traffic Control Signs	1,346	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0285	Type 3 Barricade, 8' Double Sided	4	Each
634E0600	4" Temporary Pavement Marking Tape Type I	17,808	Ft
634E0630	Temporary Pavement Marking	18.0	Mile
634E0810	Groove 6" Wide Rumble Strip	408	Ft
634E1002	Detour Signing	340.0	SqFt
720E1015	Bank and Channel Protection Gabion	3.0	CuYd
730E0212	Type G Permanent Seed Mixture	13	Lb
731E0200	Fertilizing	0.25	Ton
732E0100	Mulching	4.0	Ton
734E0154	12" Diameter Erosion Control Wattle	540	Ft
734E0165	Remove and Reset Erosion Control Wattle	135	Ft
734E0604	High Flow Silt Fence	260	Ft
734E0610	Mucking Silt Fence	18	CuYd
734E0620	Repair Silt Fence	65	Ft
734E0630	Floating Silt Curtain	5,300	Ft
831E1010	Geogrid Reinforcement	2,087	SqYd
900E0010	Refurbish Single Mailbox	6	Each
900E1980	Storage Unit	1	Each

*** - Denotes Non-Participating**

SPECIFICATIONS

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

PLOT SCALE - 1:200
PLOTTED FROM - TRAB12222
PLOT NAME - 1
FILE - ...\PRJ\CLRK04J6\04J6 BORDER.DGN

ENVIRONMENTAL COMMITMENTS

Revised 01/14/2016

ENVIRONMENTAL COMMITMENTS

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

COMMITMENT A: WETLANDS

Approximately 0.0022 acres of wetlands will be impacted by the project. Refer to the table below and the plan and profile sheets for location and boundaries of the impacted wetlands. These unavoidable impacts to wetlands are less than 0.1 acres and the "*Statewide Wetland Finding for South Dakota Federal-Aid Highway Projects"* will apply.

Table of Impacted Wetlands

Wetland No.	Type	Station	Impact Left (Acres)	Impact Right (Acres)	Temporary Impact (Acres)	Total Impact (Acres)
4	PEMC	876+80	0.00	0.0002	0.001	0.0012
6	PEMC , Lake	1043+00	0.00	0.0020	0.003	0.0050

Action Taken/Required:

Replacement of these 0.0022 acres of 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 will not be mitigated as original grades shall be re-established.

The Contractor shall notify the Project Engineer if additional easement is needed to complete the work adjacent to any wetland resources. The Project Engineer shall obtain an appropriate course of action from the Environmental Office before proceeding with construction activities that affect any wetland not identified in the above table. The contact person is the Environmental Project Scientist of the SDDOT Environmental Office at 605-773-3268.

COMMITMENT B: FEDERALLY THREATENED, ENDANGERED, AND PROTECTED SPECIES

COMMITMENT B2: WHOOPING CRANE

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

Action Taken/Required:

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

COMMITMENT C: WATER SOURCE

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

The Contractor shall not withdraw water directly from streams of the James, Big Sioux, and Vermillion watersheds without prior approval from the SDDOT Environmental Office.

Action Taken/Required:

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

COMMITMENT D: WATER QUALITY STANDARDS

COMMITMENT D1: SURFACE WATER QUALITY

The unnamed lakes and streams in the project area are classified as fish and wildlife propagation, recreation, irrigation and stock watering waters. Because of these beneficial uses, special construction measures may have to be taken to ensure that these water bodies are not impacted.

Action Taken/Required:

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

COMMITMENT D2: SURFACE WATER DISCHARGE

The unnamed lakes and streams in the project area are classified as fish and wildlife propagation, recreation, irrigation and stock watering waters. Because of these beneficial uses, special construction measures may have to be taken to ensure that these water bodies are not impacted.

Action Taken/Required:

If construction dewatering is required, the Contractor shall obtain a Temporary Discharge Permit from the DENR and provide a copy to the Project Engineer. Contact the DENR Surface Water Program at 605-773-3351 to apply for a permit.

COMMITMENT E: STORM WATER

Construction activities constitute 1 acre or more of earth disturbance.

Action Taken/Required:

The DENR and the US Environmental Protection Agency (EPA) have issued separate general permits for the discharge of storm water runoff. The DENR permit applies to discharges on state land and the EPA permit applies to discharges on federal or reservation land. The Contractor is advised this project is regulated under the Phase II Storm Water Regulations and must receive coverage under the General Permit for Construction Activities. A Notice of Intent (NOI) will be submitted to DENR a minimum of 15 days prior to project start by the DOT Environmental Office. A letter must be received from DENR that acknowledges project coverage under this general permit before project start. The Contractor is advised that permit coverage may also be required by off-site activities, such as borrow and staging areas, which are the responsibility of the Contractor.

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

A major component of the storm water construction permits is development and implementation of a Storm Water Pollution Prevention Plan (SWPPP), which is a joint effort and responsibility of the SDDOT and the Contractor. Erosion control measures and best management practices will be implemented in accordance with the SWPPP. The SWPPP is a dynamic document and is to be available on-site at all times.

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

SDDOT:
http://sddot.com/transportation/highways/environmental/stormwater/Default.aspx

DENR: http://www.denr.sd.gov/des/sw/stormwater.aspx

EPA: http://cfpub.epa.gov/npdes/home.cfm?program_id=6

PLOT SCALE - 1:200
PLOTTED FROM - TRAB12222
PLOT NAME - 1
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ENVIRONMENTAL COMMITMENTS

Contractor Certification Form:

The "Department of Environmental and Natural Resources – Contractor Certification Form" (SD EForm – 2110LDV1-ContractorCertification.pdf) shall be completed by the Contractor or their certified Erosion Control Supervisor after the award of the contract. Work may not begin on the project until this form is signed.

The form certifies under penalty of law that the Contractor understands and will comply with the terms and conditions of the Surface Water Discharge General Permit for Storm Water Discharges Associated with Construction Activities for the Project.

The online form can be found at:
http://denr.sd.gov/des/sw/eforms/E2110LDV1-ContractorCertification.pdf

COMMITMENT H: WASTE DISPOSAL SITE

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

Action Taken/Required:

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

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

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

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

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

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

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

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

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

COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES

The SDDOT has obtained concurrence with the State Historical Preservation Office (SHPO or THPO) for all work included within the project limits and all 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 review of cultural resources impacts. 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 shall arrange and pay for a cultural resource survey and/or records search. The Contractor has the option to contact the state Archaeological Research Center (ARC) at 605-394-1936 or another qualified archaeologist, to obtain either a records search or a cultural resources survey. A record search might be sufficient for review; however, a cultural resources survey may need to be conducted by a qualified archaeologist.

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

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

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

SHPO/THPO review does not relieve the Contractor of the responsibility for obtaining any additional permits and clearances for 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 shall provide the required permits and clearances to the Project Engineer at the preconstruction meeting.

COMMITMENT N: SECTION 404 PERMIT

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

Action Taken/Required:

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

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

PLOT SCALE - 1:200
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PLOT NAME - 1
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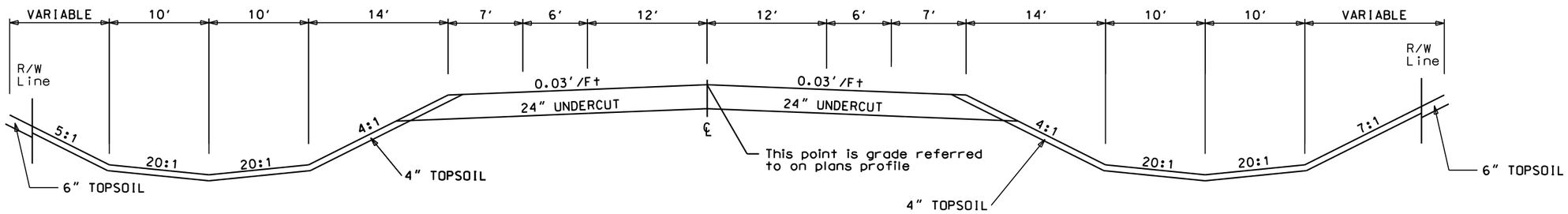
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	PH 0025(77)164	6	109

Plotting Date: 12/29/2015

TYPICAL GRADING SECTION

SD 25
Sta. 209+33.50 to Sta. 224+50.00



PLOT SCALE - 1:200

PLOT NAME - 1

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PLOTTED FROM - TRAB12222

TYPICAL SURFACING SECTION

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	PH 0025(77)164 P 0020(124)363	7	109

Plotting Date: 12/29/2015

PLOT SCALE - 1:6.00001

PLOT NAME - 2

FILE - ...\025VTYP(INFO ONLY).DGN

PLOTTED FROM - TRAB12222

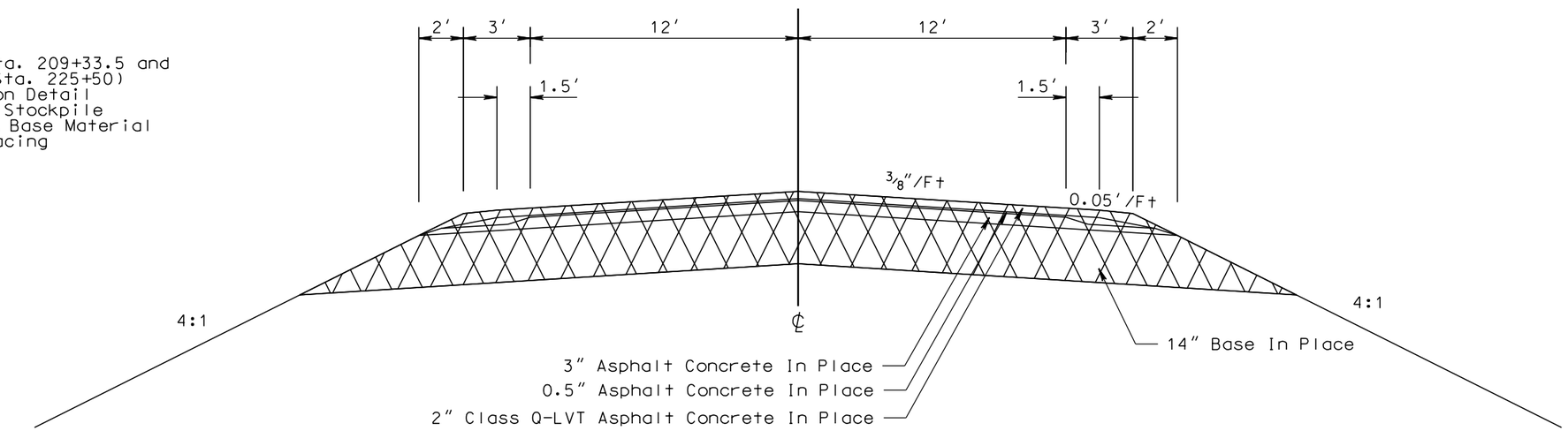
(Sta. 209+33.5 to Sta. 224+50)
Salvage & Stockpile
Asphalt Concrete & Base Material

(Sta. 208+33.5 to Sta. 209+33.5 and
Sta. 224+50 to Sta. 225+50)
See Transition Detail
for Salvage & Stockpile
Asphalt Concrete & Base Material
And Surfacing

Section 1: SD 25

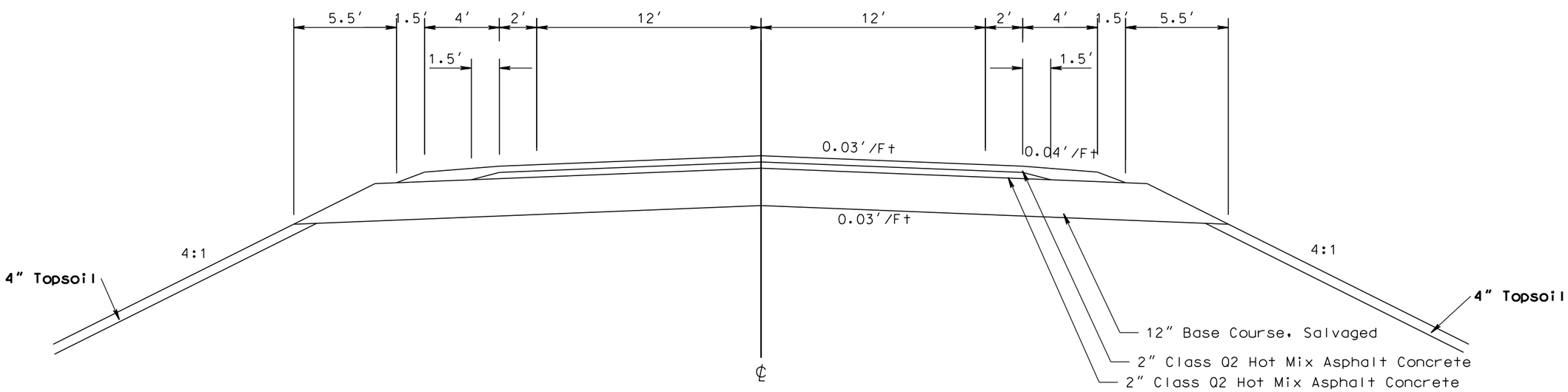
In Place Section

Sta. 208+33.5 to Sta. 225+50



Section 1: SD 25

Surfacing Section



TYPICAL RESURFACING SECTIONS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	PH 0025(77)164 P 0020(124)363	8	109

Plotting Date: 12/29/2015

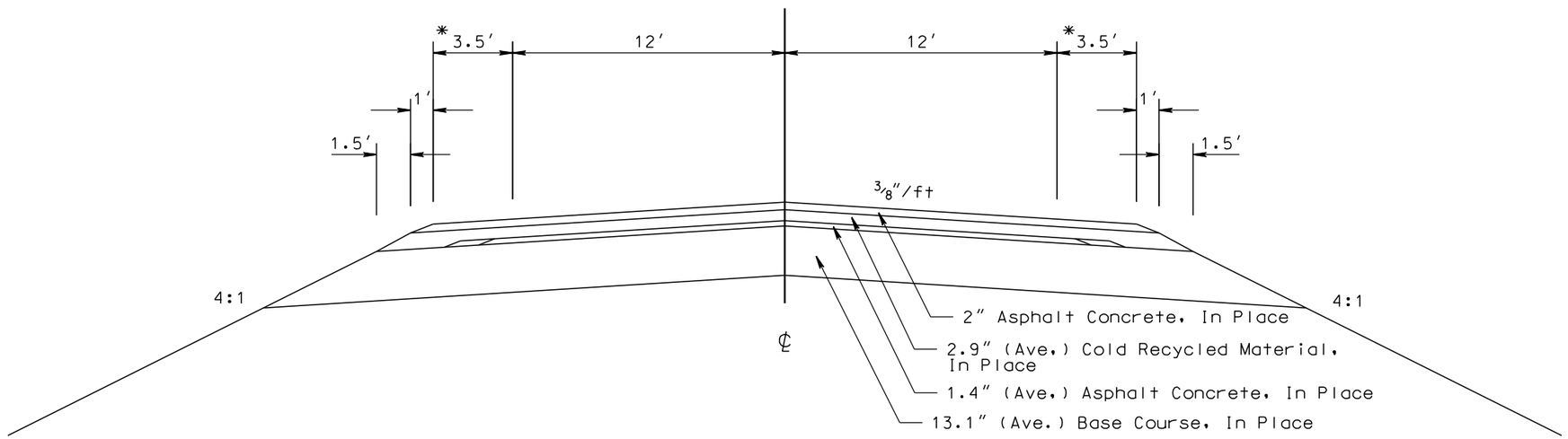
Section 2: SD 20

In Place Section

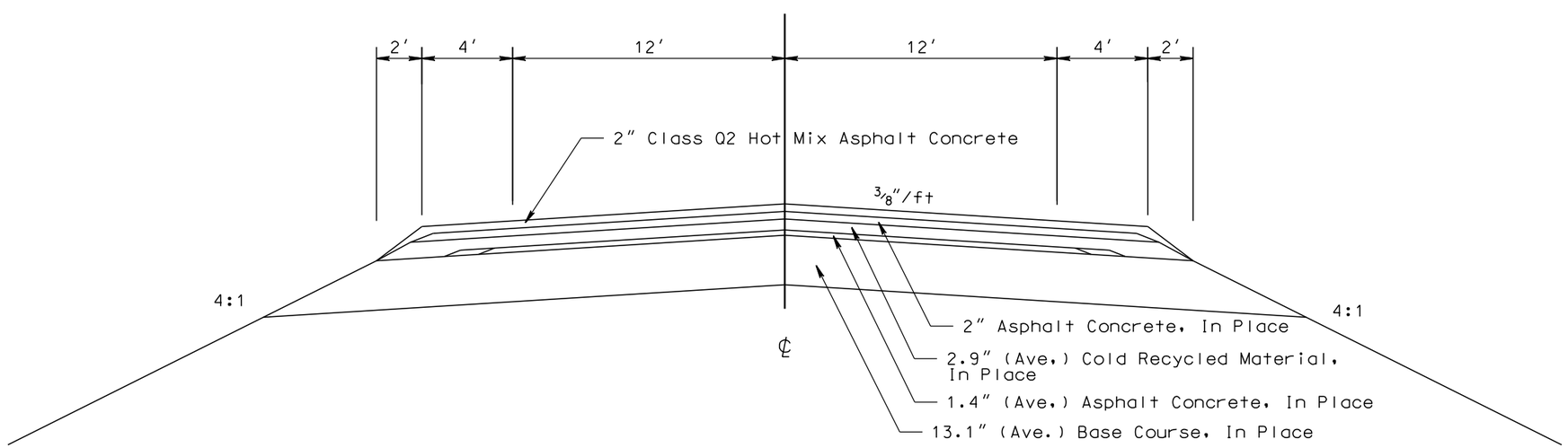
Sta. 694+10 to Sta. 1167+09.2

* Sta. 776+00 to Sta. 783+50
Sta. 893+50 to Sta. 901+50

Field adjustment to shoulder width may be required at these locations to match existing surfacing widths.



Resurfacing Section



PLOT SCALE - 1:6.00001
PLOTTED FROM - TRAB12222
PLOT NAME - 3
FILE - ...\025VTYP(INFO ONLY).DGN

RATES OF MATERIALS

The Estimate of Quantities is based on the following quantities of material per station.

SD 25 **Sta. 209+33.50 to Sta. 224+50**
Section 1

BASE COURSE, SALVAGED
Salvaged Material 319.55 Tons

Water for Granular Material at the rate of 4.59 M.Gallons.

SD 25 **Sta. 208+33.50 to Sta. 225+50**
Section 1

CLASS Q2 HOT MIXED ASPHALT CONCRETE – 2" 1st Lift

Crushed Aggregate.....	34.28 Tons
PG 64-28 Asphalt Binder.....	2.11 Tons
Total without Lime	**36.39 Tons**
Hydrated Lime.....	0.36 Tons
Total with Lime	**36.75 Tons**

The exact proportion of these materials will be determined on construction.

MC-70 Asphalt for Prime at the rate of **0.54** tons applied **41** feet wide. (Rate = 0.30 Gal./Sq.Yd.).

Blotting Sand for Prime at the rate of **1.33** tons applied **24** feet wide. (Rate = 10 Lb./Sq.Yd.).

SS-1h or CSS-1h Emulsified Asphalt for Tack at the rate of **0.09** tons applied **32** feet wide. (Rate = 0.06 Gal./Sq.Yd.).

CLASS Q2 HOT MIXED ASPHALT CONCRETE – 2" 2nd Lift

Crushed Aggregate.....	49.79 Tons
PG 64-28 Asphalt Binder.....	3.07 Tons
Total without Lime	**52.86 Tons**
Hydrated Lime.....	0.53 Tons
Total with Lime	**53.39 Tons**

The exact proportion of these materials will be determined on construction.

SS-1h or CSS-1h Emulsified Asphalt for Tack at the rate of **0.11** tons applied **40** feet wide. (Rate = 0.06 Gal./Sq.Yd.).

FLUSH SEAL

Section 1

SS-1h or CSS-1h Emulsified Asphalt for Flush Seal at the rate of **0.09** tons applied **39** feet wide. (Rate = 0.05 Gal./Sq.Yd.).

Sand for Flush Seal at the rate of **0.98** tons applied **22** feet wide. (Rate = 8 Lb./Sq.Yd.).

The Estimate of Quantities is based on the following quantities of material per mile.

SD 20 **Sta. 694+10 to Sta. 1167+09.20**
Section 2

CLASS Q2 HOT MIXED ASPHALT CONCRETE – 2" Mainline Lift

Crushed Aggregate.....	2142 Tons
PG 64-28 Asphalt Binder.....	132 Tons
Total without Lime	**2274 Tons**
Hydrated Lime.....	23 Tons
Total with Lime	**2297 Tons**

The exact proportion of these materials will be determined on construction.

SS-1h or CSS-1h Emulsified Asphalt for Tack at the rate of **8.2** tons applied **37** feet wide. (Rate = 0.09 Gal./Sq.Yd.).

FLUSH SEAL

Section 2

SS-1h or CSS-1h Emulsified Asphalt for Flush Seal at the rate of **4.5** tons applied **36** feet wide. (Rate = 0.05 Gal./Sq.Yd.).

Sand for Flush Seal at the rate of **52** tons applied **22** feet wide. (Rate = 8 Lb./Sq.Yd.).

SUMMARY OF ASPHALT CONCRETE

LOCATIONS:	Class Q2 Hot Mixed Asphalt Concrete with Specified Density Compaction TONS	Class Q2 Hot Mixed Asphalt Concrete without Specified Density Compaction TONS	Asphalt Concrete Composite without Specified Density Compaction TONS
Section 1 - 1st and 2nd lift (24' wide with Specified Density)	1027.3	519.9	-
Section 2 - (24' wide with Specified Density)	14154.7	6422.2	-
Spot leveling, strengthening, and repair of existing surface	-	3583.3	-
Table of Additional Quantities	-	583.0	2.0
Culvert Replacement Areas (SD 20)	-	-	556.0
TOTAL	**15182.0**	**11108.4**	**558.0**

PLOT SCALE - 1:200
PLOTTED FROM - TRAB12222
PLOT NAME - 1
FILE - ...\PRJ\CLRK04J6\04J6 BORDER.DGN

TABLE OF ADDITIONAL QUANTITIES

LOCATION: SD 25, PCN 04J6	CONTRACTOR FURNISHED BORROW EXCAVATION CUYD	PLACING CONTRACTOR FURNISHED TOPSOIL CUYD	WATER FOR GRANULAR MATERIAL M.GAL	SALVAGE AND STOCKPILE ASPHALT MIX AND BASE MATERIAL TON	BASE COURSE SALVAGED TON	BASE COURSE TON	ASPHALT CONCRETE COMPOSITE TON	CLASS Q2 HOT MIXED ASPHALT CONCRETE TON	PG 64-28 ASPHALT BINDER TON	HYDRATED LIME TON	Virgin Aggregate N.A.B.I. TON	COLD MILLING ASPHALT CONCRETE SQYD
Begin project: Sta. 208+33.50 to Sta. 209+33.50 (Transition detailed elsewhere in these plans)	-	-	1.1	181.0	80.0	-	-	-	-	-	-	-
End project: Sta. 224+50 to Sta. 225+50 (Transition detailed elsewhere in these plans)	-	-	1.1	181.0	80.0	-	-	-	-	-	-	-
Widening of Intersection at Junction of SD 25 & SD 20. Asphalt to be laid in two lifts (See Intersection layout elsewhere in these plans)	-	-	13.5	573.0	1040.0	-	-	240.0	13.8	2.4	223.8	-
Transition on SD 20 west of SD 25. Asphalt to be laid in two lifts (Transition detailed elsewhere in these plans)	-	-	0.5	102.0	55.0	-	-	38.0	2.2	0.4	35.4	
Transition on SD 20 east of SD 25. Asphalt to be laid in two lifts (Transition detailed elsewhere in these plans)	-	-	0.6	110.0	60.0	-	-	40.0	2.3	0.4	37.3	
Farm entrance (Sta. 213+18-L)	-	-	-	-	60.0	-	-	-	-	-	-	-
TOTALS	**0.0**	**0.0**	**16.8**	**1147.0**	**1375.0**	**0.0**	**0.0**	**318.0**	**18.3**	**3.2**	**296.6**	**0**
LOCATION: SD 20, PCN 025V												
Begin Project (Cold Mill as detailed elsewhere in these plans)	-	-	-	-	-	-	-	-	-	-	-	345
Reshape inslope and ditch (approx. Sta. 1043+00-R to Sta. 1048+75-R)	960.0	105.0	-	-	-	-	-	-	-	-	-	-
Shoulder repair due to pipe reset. (Sta. 1078+80)	-	-	-	-	-	8.0	2.0	-	-	-	-	-
2 Intersecting Roads Surfaced to ROW with Asphalt (Cold Mill as detailed elsewhere in these plans)	-	-	-	-	-	-	-	80.0	4.6	0.8	74.6	168
12 Intersecting Roads Surfaced to Radius Point with Asphalt	-	-	-	-	-	240.0	-	185.0	10.6	1.9	172.5	-
63 Farm / Residential / Field Entrances	-	-	-	-	-	1005.0	-	-	-	-	-	-
3 Unimproved Section Line roads/field entrances (Sta. 746+31.2-L, 957+56.1-L&R)	-	-	-	-	-	45.0	-	-	-	-	-	-
TOTALS	**960.0**	**105.0**	**0.0**	**0.0**	**0.0**	**1298.0**	**2.0**	**265.0**	**15.2**	**2.7**	**247.1**	**513**

The tonnage shown in the Table of Additional Quantities for Class Q2 Hot Mix Asphalt Concrete is based on an average compacted thickness of 2 inches on SD 20 and 4 inches on SD 25.

Included in the Estimate of Quantities are 1.6 tons of Asphalt for Prime MC-70 for the widening of the intersection and transition areas on SD 25.

Included in the Estimate of Quantities are 2.7 tons of Blotting Sand for Prime for the widening of the intersection and transitions areas on SD 25.

Included in the Estimate of Quantities are 0.4 tons of Asphalt for Tack SS-1h or CSS-1h for the widening of the intersection and transition areas on SD 25.

Included in the Estimate of Quantities are 0.3 tons of SS-1h or CSS-1h Asphalt for Flush Seal and 3 tons of Sand for Flush Seal for the widening of the intersection and transition areas on SD 25.

Included in the Estimate of Quantities are 1.1 tons of Asphalt for Tack SS-1h or CSS-1h for the intersecting roads and other areas throughout SD 20.

Included in the Estimate of Quantities are 0.6 tons of SS-1h or CSS-1h Asphalt for Flush Seal and 6 tons of Sand for Flush Seal for the pavement at the project limits on SD 20.

Application shall be at the rate shown on the plans or as directed by the Engineer.

The above quantities are included in the Estimate of Quantities.

PLOT SCALE - 1:200

PLOT NAME - 1

FILE - ...\PRJ\CLRK04J6\04J6 BORDER.DGN

PLOTTED FROM - TRAB12222

TABLE OF PROJECT STATIONING - PH 0025(77)164, PCN 04J6

SECTION	STATION	TO	STATION	LENGTH (Ft)	GROSS SECTION LENGTH (Ft)	GROSS SECTION LENGTH (Miles)	NET SECTION LENGTH (Ft)	NET SECTION LENGTH (Miles)
1	208+33.50	to	225+50.00	1716.5	1716.50	0.325	1716.50	0.325
				TOTAL:	1716.50	0.325	1716.50	0.325

TABLE OF PROJECT STATIONING - P 0020(124)363, PCN 025V

SECTION	STATION	TO	STATION	LENGTH (Ft)	GROSS SECTION LENGTH (Ft)	GROSS SECTION LENGTH (Miles)	NET SECTION LENGTH (Ft)	NET SECTION LENGTH (Miles)
2	694+10.00	to	1167+09.20	47299.2	47299.20	8.958	47299.20	8.958
				TOTAL:	47299.20	8.958	47299.20	8.958

TABLE OF MATERIAL QUANTITIES - PH 0025(77)164, PCN 04J6

	UNCLASSIFIED EXCAVATION, DIGOUTS	WATER FOR GRANULAR MATERIAL	BASE COURSE, SALVAGED	BASE COURSE	CLASS Q2 HOT MIXED ASPHALT CONCRETE	HYDRATED LIME	PG 64-28 ASPHALT BINDER	VIRG. AGGR. (NABI.)	CLASS Q2 HOT MIXED ASPHALT CONCRETE	PG 64-28 ASPHALT BINDER	HYDRATED LIME	VIRG. AGGR. (NABI.)	MC-70 ASPH. FOR PRIME	BLOTTING SAND FOR PRIME	SS-1h/ CSS-1h ASPH. FOR TACK	SS-1h/ CSS-1h ASPH. FOR FLUSH SEAL	SAND FOR FLUSH SEAL
					<----------1st Mainline Lift---------->				<----------2nd Mainline Lift---------->								
SECTION	CuYd	MGal	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton
1	16	69.6	4842.3	33	630.8	6.2	36.2	588.4	916.4	52.7	9.1	854.6	9.3	22.9	3.5	1.6	16.9
Sub totals	16	69.6	4842.3	33	630.8	6.2	36.2	588.4	916.4	52.7	9.1	854.6	9.3	22.9	3.5	1.6	16.9
Additional Quantities	-	16.8	1375.0	-	-	-	-	-	318.0	18.3	3.2	296.6	1.6	2.7	0.4	0.3	3.0
Culvert Replacement	-	-	-	260	-	-	-	-	-	-	-	-	-	-	-	-	-
Totals	**16**	**86.4**	**6217.3**	**293**	**630.8**	**6.2**	**36.2**	**588.4**	**1234.4**	**71.0**	**12.3**	**1151.2**	**10.9**	**25.6**	**3.9**	**1.9**	**19.9**

TABLE OF MATERIAL QUANTITIES - P 0020(124)363, PCN 025V

	UNCLASSIFIED EXCAVATION, DIGOUTS	BASE COURSE	CLASS Q2 HOT MIXED ASPHALT CONCRETE	HYDRATED LIME	PG 64-28 ASPHALT BINDER	VIRG. AGGR. (NABI.)	CLASS Q2 HOT MIXED ASPHALT CONCRETE	PG 64-28 ASPHALT BINDER	HYDRATED LIME	VIRG. AGGR. (NABI.)	ASPHALT CONCRETE COMPOSITE	SS-1h/ CSS-1h ASPH. FOR TACK	SS-1h/ CSS-1h ASPH. FOR FLUSH SEAL	SAND FOR FLUSH SEAL
			<----------Spot Leveling---------->				<----------Mainline---------->							
SECTION	CuYd	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton
2	448	896	3583.3	35.8	207.8	3339.6	20576.9	1182.5	206.0	19188.4	-	73.5	40.3	465.8
Sub totals	448	896	3583.3	35.8	207.8	3339.6	20576.9	1182.5	206.0	19188.4	0.0	73.5	40.3	465.8
Additional Quantities	-	1298	-	-	-	-	265.0	15.2	2.7	247.1	2.0	10.1	0.6	6.0
Culvert Replacement	-	2520	-	-	-	-	-	-	-	-	556.0	-	-	-
Totals	**448**	**4714**	**3583.3**	**35.8**	**207.8**	**3339.6**	**20841.9**	**1197.7**	**208.7**	**19435.6**	**558.0**	**83.6**	**40.9**	**471.8**

PLOT SCALE - 1:200
PLOT NAME - 1
FILE - ...\PRJ\CLRK04J6\04J6 BORDER.DGN
PLOTTED FROM - TRAB12222

TABLE OF MAINLINE CULVERT WORK

#	Approx MRM	Station	Side	Culvert Size and Type		Flow Direction per Orginal Constr. Plans	Incidental Work, Grading (LS)	Contractor Furnished Borrow Excavation (Cu Yd)	Remove Cattle Pass End Section (Each)	Remove Pipe for Reset (Ft)	Remove Pipe End Section (Each)	Remove Pipe End Section for Reset (Each)	Furnish and Install 24" RCP (Ft)	30" RCP (Ft)	36" RCP (Ft)	18" RCP Flared End (Each)	24" RCP Flared End (Each)	36" RCP Flared End (Each)	24" RCP Sloped End (Each)	30" RCP Sloped End (Each)	24" CMP Sloped End (Each)	Reset Pipe (Ft)	Reset Pipe End (Each)	Cleanout Pipe Culvert (Each)	Culvert Joint Cleaning (Ft)	Repair Culvert Joint (Ft)	Chemical Grout Void Fill (Gallons)	Controlled Density Fill (Cu Yd)	Comments
	SD 25																												
1	164.84+0.001	211+40	East	18"	RCP	West	Lump Sum							84						1									Replace pipe with new grading
			West																	1									
2	164.00+0.651	221+55	East	18"	RCP	West	Lump Sum						106						1										Replace pipe with new grading
			West																1										
					TOTAL		Lump Sum	0	0	0	0	0	106	84	0	0	0	0	2	2	0	0	0	0	0	0	0	0	
	SD 20																												
1	364.00+0.027	710+77	North	24"	RCP																								
			South									1											1						
2	364.00+0.149	716+00	North	18"	RCP																								No Work Required
			South																										
3	364.00+0.523	735+91	North	36"	RCP			10		6		1										6	1						Borrow for erosion repair, north side
			South									1											1						
4	365.00+0.048	763+50	North	24"	RCP					6		1										6	1						
			South							6		1										6	1						
5	365.00+0.408	781+90	North	66"	RCP			10				1											1						Borrow for inslope repair, north side
			South									1											1						
6	365.00+0.700	797+62	North	18"	RCP	North				6		1										6	1	1					
			South								1					1													
7	365.00+0.806	803+10	North	18"	CMP	North	Lump Sum						66						1										Replace pipe
			South																1										
8	366.00+0.010	816+45	North	24"	RCP																								No Work Required
			South																										
9	366.00+0.282	830+90	North	30"	CMP	North	Lump Sum							92						1									Replace pipe
			South																	1									
10	366.00+0.644	850+00	North	24"	CMP	North	Lump Sum						86				1												Replace pipe
			South														1												
11	367.00+0.204	876+80	North	24"	CMP	North															1								Cut off 1' of pipe on both sides and put on sloped ends
			South																		1								
12	367.42+0.176	896+00	North	24"	CMP	North	Lump Sum						110				1												Replace pipe
			South														1												
13	367.42+0.351	905+25	North	18"	RCP					6		1										6	1						
			South									1											1						
14	368.00+0.068	922+60	North	18"	RCP							1											1						
			South																										
15	368.00+0.226	931+73	North	18"	RCP	North					1					1													
			South									1											1						
16	368.00+0.382	939+12	North	18"	RCP					6		1										6	1						
			South									1											1						
17	368.00+0.585	949+88	North	18"	RCP							1											1						
			South									1											1						
18	368.00+0.781	958+00	North	24"	RCP	North				6		1										6	1						
			South								1								1										
19	368.00+0.942	968+00	North	18"	RCP							1											1						
			South									1											1						
20	369.00+0.186	978+91	North	18"	RCP							1											1						
			South							6		1										6	1						
21	369.00+0.299	985+06	North	18"	RCP	North						1											1						
			South								1					1													
22	369.00+0.659	1004+06	North	24"	RCP			10		6		1										6	1						Borrow for erosion repair, north side
			South																										

PLOT SCALE - 1:200

PLOTTED FROM - TRAB12222

PLOT NAME - 1

FILE - ...\PRJ\CLRK04J6\04J6 BORDER.DGN

TABLE OF MAINLINE CULVERT WORK

#	Approx MRM	Station	Side	Culvert Size and Type		Flow Direction per Orginal Constr. Plans	Incidental Work, Grading (LS)	Contractor Furnished Borrow Excavation (Cu Yd)	Remove Cattle Pass End Section (Each)	Remove Pipe for Reset (Ft)	Remove Pipe End Section (Each)	Remove Pipe End Section for Reset (Each)	Furnish and Install 24" RCP (Ft)	30" RCP (Ft)	36" RCP (Ft)	18" RCP Flared End (Each)	24" RCP Flared End (Each)	36" RCP Flared End (Each)	24" RCP Sloped End (Each)	30" RCP Sloped End (Each)	24" CMP Sloped End (Each)	Reset Pipe (Ft)	Reset Pipe End (Each)	Cleanout Pipe Culvert (Each)	Culvert Joint Cleaning (Ft)	Repair Culvert Joint (Ft)	Chemical Grout Void Fill (Gallons)	Controlled Density Fill (Cu Yd)	Comments
	SD 20																												
23	369.00+0.923	1020+00	North	18"	RCP							1											1						
			South									1											1						
24	370.00+0.308	1034+25	North	24"	RCP					6		1										6	1						
			South							6		1										6	1						
25	370.00+0.410	1043+00	North	24"	CMP	South	Lump Sum						114						1										Replace pipe & Reshape south inslope
			South																1										
26	370.00+0.605	1053+75	North	24"	RCP																								
			South							6		1										6	1						
27	370.00+0.767	1062+15	North	18"	RCP																								No work required
			South																										
28	371.00+0.022	1078+80	North	36"	RCP					12		1										12	1		66	66	70		Pipe joint repair and void grouting. Possible repair to shoulder due to pipe reset.
			South							12		1										12	1						
29	371.00+0.440	1100+90	North	24"	RCP					12		1										12	1						
			South							12		1										12	1						
30	371.00+0.593	1108+80	North	18"	RCP					6		1										6	1						
			South									1											1						
31	371.00+0.711	1115+00	North	18"	RCP		Lump Sum								70			1											Replace pipe
			South															1											
32	371.00+0.734	1116+20	North	18"	RCP		Lump Sum						86						1										Replace pipe
			South																1										
33	371.00+0.938	1126+60	North	24"	RCP					12		1										12	1	1					
			South							12		1										12	1						
34	372.00+0.249	1143+00	North	18"	RCP																								No work required
			South																										
35	372.00+0.548	1158+00	North	4'X6'	Cattle Pass	North	Lump Sum	350	1				84						1									32	Line Cattle Pass with 24" RCP
			South					650	1										1										
36	372.00+0.638	1161+80	North	42"	RCP					8		1										8	1						
			South							4		1										4	1						
				TOTAL			**Lump Sum**	**1030**	**2**	**162**	**4**	**38**	**546**	**92**	**70**	**3**	**4**	**2**	**9**	**2**	**2**	**162**	**38**	**2**	**66**	**66**	**70**	**32**	

Culvert Inspection was done on 6-22-15 at a time when several culverts were underwater. Culvert type and size obtained from a combination of visual inspection and original construction plans. Additional repair may be required at time of construction.

TABLE OF APPROACH PIPE QUANTITIES

HWY	Station	Offset (L/R)	Reinforced Concrete: Circular 15" Cl. 2 Ft	Circular 18" Cl. 2 Ft		Circular Flared End 15" Each	Circular Flared End 18" Each		Circular Safety End 18" Each			Circular Bend 18' 7.5° Each			Arch to Round Transition 18" to 18" Each				Arch 18" Cl. 2 Ft		Corrugated Metal: Circular 18" 16 Ga Ft		Circular Safety End 18" Each			Remove Pipe for Reset Ft	Remove Pipe End Section for Reset Each	Reset Pipe Ft	Reset Pipe End Section Each	Clean Out Pipe Culvert Each
SD 25	213+18-45' L																				60		2							
		Subtotal:	0	0		0	0		0			0			0				0		60		2			0	0	0	0	0

PLOT SCALE - 1:200

PLOT NAME - 1

FILE - ...\PRJ\CLRK04J6\04J6 BORDER.DGN

PLOTTED FROM - TRAB12222

SD 25, PH 0025(77)164, PCN 04J6 Permanent Sign Installation Table

MRM + Displacement	Side of Road	Description	Sign Code	Width (Inches)	Height (Inches)	Flat Aluminum Sign, Nonremovable Copy High Intensity (SqFt)	Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity (SqFt)	2.0"x2.0" Perforated Tube Post 12 Ga. (Ft)	2.5"x2.5" Perforated Tube Post 10 Ga. (Ft)	(N.A.B.I.) Square Tube Anchor Sleeve (Each)	(N.A.B.I.) 48" Winged Slip Base Anchor (Each)	Remove Traffic Sign (Each)	Remove Sign For Reset (Each)	Reset Sign (Each)	Direction Sign Faces	Current Type of Post	Remarks
164.00 + 0.641	Rt.	No Passing Zone	W14-3	48X48X36			5.6	12		1		1			N	U-Channel	Replace Existing Sign with New Sign on New Post
164.00 + 0.695		Junction Marker	M2-1	21	15	2.2		12		1					S		Replace Existing Signs with New Signs on New Post 850 Ft. From Edge of Interescting Road
		SD 20	M1-5	24	24	4.0									S		
164.00 + 0.733	Rt.	Webster 17 / Bradley 5 / Wallace 3	D1-3	102	48	34.0			30		2	1			S	4" X 6" Wood	Replace Existing Sign at 164.00 + 0.768 with New Sign on New Post at 164.00 + 0.733, 650 Ft. From Edge of Intersecting Road
164.00 + 0.771	Rt.	SD 20	M1-5	24	24	4.0		24		2		1			S	Telespar	Replace Existing Sign Assembly at 164.00 + 0.841 with New Assembly on New Posts at 164.00 + 0.771, 450Ft. From Edge of Intersecting Road
		Horizontal Double Arrow	M6-4	21	15	2.2									S		
		SD 25	M1-5	24	24	4.0									S		
		Vertical Arrow	M6-3	21	15	2.2									S		
164.00 + 0.795	Lt.	South	M3-3	24	12	2.0		11		1		1			N	U-Channel	Replace Existing Sign Assembly at 164.00 + 0.825 with New Assembly on New Post at 164.00 + 0.795, 300Ft. From Edge of Intersecting Road
		SD 25	M1-5	24	24	4.0									N		
164.00 + 0.844	Rt.	Street Sign											1	1		Telespar	Reset Existing Street Sign
164.00 + 0.849 SEE REMARKS	Rt.	SD 25	M1-5	24	24	4.0		24		2		1			W	Telespar	Replace Existing Sign Assembly Located at the Southeast Corner of SD 20 / SD 25 with New Sign Assembly on New Post. Place Sign Approximately 15 Ft. Back From Stop Bar (East of the Stop Bar, South Side of the Road)
		Horizontal Double Arrow	M6-4	21	15	2.2											
		SD 20	M1-5	24	24	4.0											
		Vertical Arrow	M6-3	21	15	2.2											
164.00 + 0.860	Rt.	Stop	R1-1	48	48								1	1	E	Telespar	Reset Existing Sign and Conspiquity Markers on Existing Posts
164.00 + 0.921	Lt.	SD 20	M1-5	24	24	4.0		24		2		1			N	4" X 6" Wood	Replace Existing Sign Assembly at 164.00 + 0.874 with New Assembly on New Post at 164.00 + 0.921, Approximately 310Ft. From Edge of Intersecting Road
		Horizontal Double Arrow	M6-4	21	15	2.2									N		
		SD 25	M1-5	24	24	4.0									N		
		Vertical Arrow	M6-3	21	15	2.2									N		
					TOTAL	83.3	5.6	107.0	30.0	9	2	6	2	2			

PLOTTED FROM - TRAB10100

Sign Summary SD 25

Sign Code	Description	Width (Inches)	Height (Inches)	Sq. Ft.	Quantity	Flat Aluminum Sign, Nonremovable Copy High Intensity (SQFT)	Flat Aluminum Sign, Nonremovable Copy Super or Very High Intensity (SQFT)	Text / Background
D1-3	Webster 17 / Bradley 5 / Wallace 3	102	48	34.0	1	34.0		White on Green
M1-5	SD 20	24	24	4.0	4	16.0		See Standard Plate 632.20
M1-5	SD 25	24	24	4.0	4	16.0		See Standard Plate 632.20
M2-1	Junction Marker	21	15	2.2	1	2.2		Black on White/Green Border
M3-3	South	24	12	2.0	1	2.0		Black on White/Green Border
M6-3	Vertical Arrrow	21	15	2.2	3	6.6		Black on White/Green Border
M6-4	Horizontal Double Arrow	21	15	2.2	3	6.6		Black on White/Green Border
W14-3	No Passing Zone	48X48X36		5.6	1		5.6	Black on Fluorescent Yellow
					Totals	**83.3**	**5.6**	

PLOTTED FROM - TRAB10100

SD 20, P 0020(124)363, PCN 025V Permanent Sign Installation Table

MRM + Displacement	Side of Road	Description	Sign Code	Width (Inches)	Height (Inches)	Flat Aluminum Sign, Nonremovable Copy High Intensity (SqFt)	Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity (SqFt)	2.0"x2.0" Perforated Tube Post 12 Ga. (Ft)	2.5"x2.5" Perforated Tube Post 10 Ga. (Ft)	(N.A.B.I.) Square Tube Anchor Sleeve (Each)	(N.A.B.I.) 48" Winged Slip Base Anchor (Each)	Remove Traffic Sign (Each)	Remove Sign For Reset (Each)	Reset Sign (Each)	Direction Sign Faces	Current Type of Post	Remarks
363.00 + 0.755	Rt.	East	M3-2	24	12	2.0		10		1		1			W	U-Channel	Replace Existing Sign Assembly with New Sign Assembly on New Post
		SD 20	M1-5	24	24	4.0									W		
364.00 + 0.535	Lt.	No Passing Zone	W14-3	48x48x36			5.6	12		1		1			W	U-Channel	Replace Existing Sign with New Sign on New Post
364.00 + 0.725	Rt.	Stop	R1-1	30	30		5.2	10		1		1			S	U-Channel	Replace Existing Sign with New Sign on New Post
364.00 + 0.959	Rt.	No Passing Zone	W14-3	48x48x36			5.6	12		1		1			E	U-Channel	Replace Existing Sign with New Sign on New Post
364.00 + 0.982	Lt.	No Passing Zone	W14-3	48x48x36			5.6	12		1		1			W	U-Channel	Replace Existing Sign with New Sign on New Post
365.00 + 0.293	Rt.	No Passing Zone	W14-3	48x48x36			5.6	12		1		1			E	U-Channel	Replace Existing Sign with New Sign on New Post
365.00 + 0.368	Lt.	No Passing Zone	W14-3	48x48x36			5.6	12		1		1			W	U-Channel	Replace Existing Sign with New Sign on New Post
365.00 + 0.714	Lt.	Stop	R1-1	30	30		5.2	10		1		1			N	U-Channel	Replace Existing Sign with New Sign on New Post
364.00 + 0.724	Rt.	Stop	R1-1	30	30		5.2	10		1		1			S	U-Channel	Replace Existing Sign with New Sign on New Post
365.00 + 0.767	Rt.	No Passing Zone	W14-3	48x48x36			5.6	12		1		1			E	U-Channel	Replace Existing Sign with New Sign on New Post
366.00 + 0.612	Lt.	No Passing Zone	W14-3	48x48x36			5.6	12		1		1			W	U-Channel	Replace Existing Sign with New Sign on New Post
366.00 + 0.670	Lt.	Stop	R1-1	36	36		7.5	11		1		1			N	U-Channel	Replace Existing Sign with New Sign on New Post
366.00 + 0.678	Rt.	Stop	R1-1	36	36		7.5	11		1		1			S	U-Channel	Replace Existing Sign with New Sign on New Post
367.00 + 0.009	Rt.	No Passing Zone	W14-3	48x48x36				12		1			1	1	E	U-Channel	Reset Existing Sign on New Post
367.00 + 0.134	Lt.	West	M3-4	24	12	2.0		10		1		1			E	U-Channel	Replace Existing Sign Assembly with New Sign Assembly on New Post
		SD 20	M1-5	24	24	4.0									E		
367.00 + 0.191	Lt.	No Passing Zone	W14-3	48x48x36			5.6	12		1		1			W	U-Channel	Replace Existing Sign with New Sign on New Post
367.00 + 0.245	Rt.	Intersection Warning (Through, Right)	W2-2	30	30		6.3	11		1		1			W	U-Channel	Replace Existing Sign with New Sign on New Post
367.00 + 0.294	Lt.	Speed Limit 65 MPH	R2-1	24	30	5.0		11		1					E		New Sign Install
367.00 + 0.294	Rt.	Bradley Pop. 72	D1-1D	60	24	10.0		26		2		1			W	U-Channel	Replace Existing Sign with New Sign on New Post
367.00 + 0.399	Rt.	Stop	R1-1	30	30		5.2	10		1		1			S	4" X 6" Wood	Replace Existing Sign with New Sign on New Post
367.00 + 0.446	Rt.	East	M3-2	24	12	2.0		10		1		1			W	U-Channel	Replace Existing Sign Assembly with New Sign Assembly on New Post
		SD 20	M1-5	24	24	4.0									W		
367.00 + 0.484	Rt.	Speed Limit 65 MPH	R2-1	24	30	5.0		11		1					W		New Sign Install
367.00 + 0.491	Lt.	Bradley Pop. 72	D1-1D	60	24	10.0		26		2		1			E	U-Channel	Replace Existing Sign with New Sign on New Post

PLOTTED FROM - TRAB10100

SD 20, P 0020(124)363, PCN 025V Permanent Sign Installation Table

MRM + Displacement	Side of Road	Description	Sign Code	Width (Inches)	Height (Inches)	Flat Aluminum Sign, Nonremovable Copy High Intensity (SqFt)	Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity (SqFt)	2.0"x2.0" Perforated Tube Post 12 Ga. (Ft)	2.5"x2.5" Perforated Tube Post 10 Ga. (Ft)	(N.A.B.I.) Square Tube Anchor Sleeve (Each)	(N.A.B.I.) 48" Winged Slip Base Anchor (Each)	Remove Traffic Sign (Each)	Remove Sign For Reset (Each)	Reset Sign (Each)	Direction Sign Faces	Current Type of Post	Remarks
367.00 + 0.602	Rt.	No Passing Zone	W14-3	48x48x36			5.6	12		1		1			E	U-Channel	Replace Existing Sign with New Sign on New Post
367.00 + 0.733	Lt.	Stop	R1-1	36	36		7.5	11		1		1			N	U-Channel	Replace Existing Sign with New Sign on New Post
367.00 + 0.739	Rt.	Stop	R1-1	36	36		7.5	11		1		1			S	U-Channel	Replace Existing Sign with New Sign on New Post
367.00 + 0.763	Lt.	No Passing Zone	W14-3	48x48x36			5.6	12		1		1			W	U-Channel	Replace Existing Sign with New Sign on New Post
368.00 + 0.138	Rt.	No Passing Zone	W14-3	48x48x36			5.6	12		1		1			E	U-Channel	Replace Existing Sign with New Sign on New Post
369.00 + 0.289	Lt.	No Passing Zone	W14-3	48x48x36			5.6	12		1		1			W	U-Channel	Replace Existing Sign with New Sign on New Post
369.00 + 0.597	Lt.	No Passing Zone	W14-3	48x48x36			5.6	12		1		1			W	U-Channel	Replace Existing Sign with New Sign on New Post
369.00 + 0.647	Rt.	No Passing Zone	W14-3	48x48x36			5.6	12		1		1			E	U-Channel	Replace Existing Sign with New Sign on New Post
369.00 + 0.707	Lt.	Stop	R1-1	30	30		5.2	10		1		1			N	U-Channel	Replace Existing Sign with New Sign on New Post
369.00 + 0.714	Rt.	Stop	R1-1	30	30		5.2	10		1		1			S	U-Channel	Replace Existing Sign with New Sign on New Post
370.00 + 0.000	Rt.	No Passing Zone	W14-3	48x48x36			5.6	12		1		1			E	U-Channel	Replace Existing Sign with New Sign on New Post
370.00 + 0.541	Lt.	No Passing Zone	W14-3	48x48x36			5.6	12		1		1			W	U-Channel	Replace Existing Sign with New Sign on New Post
370.00 + 0.790	Lt.	Stop	R1-1	30	30		5.2	10		1		1			N	U-Channel	Replace Existing Sign with New Sign on New Post
370.00 + 0.797	Rt.	Stop	R1-1	30	30		5.2	10		1		1			S	U-Channel	Replace Existing Sign with New Sign on New Post
370.00 + 0.876	Rt.	No Passing Zone	W14-3	48x48x36			5.6	12		1		1			E	U-Channel	Replace Existing Sign with New Sign on New Post
371.00 + 0.042	Lt.	No Passing Zone	W14-3	48x48x36			5.6	12		1		1			W	U-Channel	Replace Existing Sign with New Sign on New Post
371.00 + 0.403	Rt.	No Passing Zone	W14-3	48x48x36			5.6	12		1		1			E	U-Channel	Replace Existing Sign with New Sign on New Post
371.00 + 0.712	Lt.	West	M3-4	24	12	2.0		10		1		1			E	U-Channel	Replace Existing Sign Assembly with New Sign Assembly on New Post
		SD 20	M1-5	24	24	4.0									E		
371.00 + 0.734	Rt.	Stop	R1-1	30	30		5.2	10		1		1			S	U-Channel	Replace Existing Sign with New Sign on New Post

PLOTTED FROM - TRAB10100

SD 20, P 0020(124)363, PCN 025V Permanent Sign Installation Table

MRM + Displacement	Side of Road	Description	Sign Code	Width (Inches)	Height (Inches)	Flat Aluminum Sign, Nonremovable Copy High Intensity (SqFt)	Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity (SqFt)	2.0"x2.0" Perforated Tube Post 12 Ga. (Ft)	2.5"x2.5" Perforated Tube Post 10 Ga. (Ft)	(N.A.B.I.) Square Tube Anchor Sleeve (Each)	(N.A.B.I.) 48" Winged Slip Base Anchor (Each)	Remove Traffic Sign (Each)	Remove Sign For Reset (Each)	Reset Sign (Each)	Direction Sign Faces	Current Type of Post	Remarks
372.00 + 0.147	Lt.	No Passing Zone	W14-3	48x48x36			5.6	12		1		1			W	U-Channel	Replace Existing Sign with New Sign on New Post
372.00 + 0.552	Rt.	No Passing Zone	W14-3	48x48x36			5.6	12		1		1			E	U-Channel	Replace Existing Sign with New Sign on New Post. Remove Junction and Route Marker and Place at New Location. See Below
372.00 + 0.573	Rt.	Stop Ahead	W3-1	36	36		9.0	12		1		1			W	Telespar	Replace Existing Sign at 372.00 + 0.376 with New Sign on New Post at 372.00 + 0.573
372.00 + 0.579	Lt.	No Passing Zone	W14-3	48x48x36			5.6	12		1		1			W	U-Channel	Replace Existing Sign with New Sign on New Post
372.00 + 0.611	Rt.	Junction	M2-1	21	15	2.2		11		1		1			W	U-Channel	Replace Existing Sign at 372.00 + 0.552 with New Sign on New Post at 372.00 + 0.611. Removal Paid for By No Passing Zone at 372.00 + 0.552
		SD 25	M1-5	24	24	4.0									W		
372.00 + 0.649	Rt.	East	M3-2	24	12	2.0		12		1					W		New Sign Install
		SD 20	M1-5	24	24	4.0									W		New Sign Install
		Vertical Arrow	M6-3	21	15	2.2									W		New Sign Install
372.00 + 0.650	Lt.	Speed Limit 65 MPH	R2-1	24	30	5.0		11		1		1			E		Replace Existing Sign with New Sign on New Post
372.00 + 0.687	Rt.	Watertown 28 / Webster 17 / 212 16	D1-3	120	54	45.0		32		2		1			W	4" X 6" Wood	Replace Existing Sign at 372.00 + 0.649 with New Sign on New Post at 372.00 + 0.687
372.00 + 0.700	Lt.	West	M3-4	24	12	2.0		10		1		1			E	4" X 6" Wood	Replace Existing Sign Assembly with New Sign Assembly on New Post
		SD 20	M1-5	24	24	4.0									E		
372.00 + 0.724	Lt.	SD 25	M1-5	24	24	4.0		24		2		1			E	4" X 6" Wood	Replace Existing Sign Assembly with New Sign Assembly on New Post
		Horizontal Double Arrow	M6-4	21	15	2.2									E		
		SD 20	M1-5	24	24	4.0									E		
		Vertical Arrow	M6-3	21	15	2.2									E		
372.00 + 0.727	Rt.	Stop	R1-1	48	48		13.2	26		2		1			W	Telespar	Replace Existing Sign with New Sign on New Post. Reset Conspicuity Markers.
					TOTAL	136.8	228.5	673.0	0.0	58	0	49	1	1			

PLOTTED FROM - TRAB10100

Sign Summary SD 20

Sign Code	Description	Width (Inches)	Height (Inches)	Sq. Ft.	Quantity	Flat Aluminum Sign, Nonremovable Copy High Intensity (SQFT)	Flat Aluminum Sign, Nonremovable Copy Super or Very High Intensity (SQFT)	Text / Background
D1-1D	Bradley Pop. 72	60	24	10.0	2	20.0		White on Green
D1-3	Watertown 28 / Webster 17 / US 212 16	120	54	45.0	1	45.0		White on Green
M1-5	SD 20	24	24	4.0	7	28.0		See Standard Plate 632.20
M1-5	SD 25	24	24	4.0	2	8.0		See Standard Plate 632.20
M2-1	Junction Marker	21	15	2.2	1	2.2		Black on White/Green Border
M3-2	East	24	12	2.0	3	6.0		Black on White/Green Border
M3-4	West	24	12	2.0	3	6.0		Black on White/Green Border
M6-3	Vertical Arrow	21	15	2.2	2	4.4		Black on White/Green Border
M6-4	Horizontal Double Arrow	21	15	2.2	1	2.2		Black on White/Green Border
R1-1	Stop	30	30	5.2	9		46.8	White on Red
R1-1	Stop	36	36	7.5	4		30.0	White on Red
R1-1	Stop	48	48	13.2	1		13.2	White on Red
R2-1	Speed Limit 65 MPH	24	30	5.0	3	15.0		Black on White
W14-3	No Passing Zone	48X48X36		5.6	22		123.2	Black on Fluorescent Yellow
W2-2	Intersection Warning (Through, Right)	30	30	6.3	1		6.3	Black on Fluorescent Yellow
W3-1	Stop Ahead Symbol	36	36	9.0	1		9.0	Black on Fluorescent Yellow
					Totals	**136.8**	**228.5**	

PLOTTED FROM - TRAB10100

SURFACING THICKNESS DIMENSIONS

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

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

SCOPE OF WORK

Work on this project involves grading, culvert repairs and replacement, placement of Asphalt Concrete pavement, rumble strip and stripe, permanent signing and pavement markings.

SEQUENCE OF OPERATIONS (SD 25, PCN 04J6)

Traffic shall be maintained through SD 25 and the junction of SD 20, and access shall be provided to the adjacent landowners, at all times.

The following general Sequence of Operations shall be adhered to. Any changes must be approved in writing by the Area Engineer prior to changes being made.

1. Install fixed location construction signing prior to start of work.
2. Install erosion control devices.
3. Remove existing surfacing and begin grading operations.
4. Complete grading activities.
5. Complete permanent seeding operations.
6. Complete asphalt paving operations.
7. Grind rumble stripes.
8. Place Flush Seal.
9. Install permanent pavement markings.
10. Install new permanent signing.
11. Refurbish mailbox.
12. Remove fixed location construction project signing.
13. Complete any remaining project cleanup.

SEQUENCE OF OPERATIONS (SD 20, PCN 025V)

The Contractor shall submit to the Area Engineer a minimum of 2 weeks prior to the Preconstruction Meeting a detailed plan of how the culvert replacement will be staged. The plans shall show how the Contractor is going to maintain traffic, where equipment and materials are going to be stored on the project site and the total length of the work space. These plans shall be approved by the Area Engineer prior to starting work on the culvert replacement.

Before paving of class Q2 hot mixed asphalt concrete on the mainline, traffic must be run on the asphalt concrete composite (culvert replacement areas) for a minimum of 14 days.

The following general Sequence of Operations shall be adhered to. Any changes must be approved in writing by the Area Engineer prior to changes being made.

1. Install fixed location construction signing prior to start of work.
2. Install erosion control devices.
3. Complete culvert repairs and replacements.
4. Excavate digouts and complete backfill operations.
5. Complete all asphalt concrete strengthening and leveling.
6. Complete gravel placement operations on rural approaches and intersecting roads.
7. Knockdown gravel on approaches and intersecting roads.
8. Complete asphalt paving operations.
9. Final shaping of gravel on approaches and intersecting roads.
10. Grind rumble stripes and strips.
11. Place flush seal if required.
12. Install permanent pavement markings.
13. Install new permanent signing.
14. Refurbish mailboxes.
15. Remove fixed location construction project signing.
16. Mow project inslopes and complete any remaining project cleanup.

GRADING OPERATIONS (SD 25)

Water for Embankment is estimated at the rate of 10 gallons of water per cubic yard of Embankment minus Waste.

The estimated cubic yards of excavation and/or embankment required to construct outlet ditches, ditch blocks, and approaches are included in the earthwork balance notes on the profile sheets.

Special ditch grades and other sections of the roadway different than the typical sections shall be constructed to the limits shown on the cross sections. If significant changes to the cross sections are necessary during construction, the Engineer shall contact the Designer for the proposed change.

Generally, all shallow inlet and outlet ditches as noted on the plan sheets shall be cut with a 10-foot wide bottom with 5:1 backslopes. However, the Engineer may direct the Contractor to adjust the ditch width for proper alignment with the drainage structure.

UTILITIES

For SD 25 Grading:
The Contractor shall 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 shall 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.

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

TRAFFIC CONTROL

SD 25 and SD 20 shall remain open to traffic at all times.

During non-working hours a 24' roadway top shall be maintained on SD 25 at all times with the edge of the roadway marked with cones. All related costs to furnish, place and maintain the cones shall be incidental to the contract lump sum price for TRAFFIC CONTROL, MISCELLANEOUS.

Work activities during non-daylight hours are subject to prior approval.

Work zones for the various construction operations that utilize a pilot car shall not exceed 3 miles in length.

The bottom of signs on portable or temporary supports shall not be less than seven feet above the pavement in urban areas and one foot above the pavement in rural areas. Portable sign supports may be used as long as the duration is less than 3 days. If the duration is more than 3 days the signs shall be on fixed location, ground mounted, breakaway supports.

Traffic Control signs, as shown in the Itemized List for Traffic Control Signs, are estimates. Contractor's operation may require adjustments in quantities, either more or less. Payment will be for those signs actually ordered by the Engineer and used.

An Advisory Speed Plate displaying XX M.P.H shall be attached to all "Bump" signs used on the project. These speed plates are included in the table of Itemized List for Traffic Control Signs in these plans.

PLOT SCALE - 1:200
PLOTTED FROM - TRAB12222
PLOT NAME - 1
FILE - ...\PRJ\CLRK04J6\04J6 BORDER.DGN

TRAFFIC CONTROL (CONTINUED)

Traffic Control for culvert repair work shall be as follows:

For signing purposes, a work area shall be no longer than two miles for culvert repair operations.

Flaggers and FLAGGER symbol signs shall be in place when work activities or equipment present a hazard to workers, through traffic, or encroaches into driving lanes open to traffic.

Traffic Control for mainline culvert replacement shall be as follows:

Signing for a maximum of 2 work sites has been included in the Itemized List for Traffic Control. A Maximum of 2 sites may be worked on simultaneously. The length of a work zone shall be limited to 1 culvert site and there shall be a minimum of 1000 Ft between work zones. If 2 culverts are within 200 Ft of each other it can be considered 1 work site.

Flaggers shall be used to control traffic during working hours as depicted on Standard Plate 634.23.

During nonworking hours traffic shall be controlled by the use of STOP signs as depicted on Standard Plate 634.25.

Type 3 Barricades shall be placed on each side of the open cut and also in front of any equipment and material on the roadway.

Maximum spacing of channelizing devices along the work space shall be 20 feet.

Loose Gravel signs shall be placed when appropriate at the culvert replacement sites.

During the culvert replacement the Contractor shall be required to widen the shoulders with Base Course to accommodate traffic through the project on SD 20. All costs to temporarily widen the roadway at the culvert replacement sites shall be incidental to the contract lump sum price for CONSTRUCTION AND MAINTENANCE OF DETOUR(S). At a minimum the widening shall be constructed so that no part of the inslope is steeper than 3:1 and that a minimum of 12” of granular material is placed to accommodate traffic.

Upon completion of the installation of the new culvert installation any excess materials used for temporary widening no longer required shall be removed from the project. All costs to remove the temporary widening shall be incidental to the contract lump sum price for CONSTRUCTION AND MAINTENANCE OF DETOUR(S).

4” TEMPORARY PAVEMENT MARKING TAPE TYPE I (SD 20)

The 4” Temporary Pavement Marking Tape Type I shall be used to mark the No Passing Zones and Stop Bars as indicated by the Standard Plate 634.25.

Temporary Raised Pavement Markers may be used in place of the temporary pavement marking tape to mark the No Passing Zones.

A quantity of 2,544 feet of temporary pavement marking tape has been provided for in the Estimate of Quantities for each culvert replacement location.

TYPE III FIELD LABORATORY

The lab shall be equipped with an internet connection such as DSL, cable modem, or other approved service. The internet connection shall be provided with a multi-port wireless router. The internet connection shall be a minimum speed of 512 Kb unless limited by job location and approved by the DOT. Prior to installing the wireless router the Contractor shall 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 shall be incidental to the contract unit price per each for TYPE III FIELD LABORATORY.

STORAGE UNIT

The Contractor shall provide a storage unit such as a portable storage container or a semi-trailer meeting the minimum size requirements shown below:

Project Total Asphalt Concrete Tonnage	Minimum Internal Size (Cu Ft)	Minimum External Size (L x W x H)
All Gyratory Controlled QC/QA Projects	2,360	40’ x 8’ x 8.6’ std

The storage unit is intended for use only by the Engineer for the duration of the project. The QC lab personnel or the Contractor will not be allowed to use the storage container while it is on the project, without permission of the Engineer.

The storage unit shall be on site and operational prior to asphalt concrete production. Upon completion of asphalt concrete production, the Engineer will notify the Contractor when the storage unit can be removed from the project. The storage unit use will not exceed 30 calendar days from the completion of asphalt concrete production. The storage unit will remain the property of the Contractor.

The storage unit shall be weather proof and shall be set in a level position. The storage unit shall be able to be locked with a padlock.

The storage unit shall be placed adjacent to the QA lab, as approved by the Engineer.

The following shall apply when the storage unit provided on the project is a portable storage container:

1. The portable storage container shall be constructed of steel.
2. The portable storage container shall be set such that it is raised above the surrounding ground level to keep water from ponding under or around the storage container.

The following shall apply when the storage unit provided on the project is a semi-trailer:

1. A set of steps and hand railings shall be provided at the exterior door.
2. If the floor of the semi-trailer is 18 inches or more above the ground, a landing shall be constructed at the exterior door. The minimum dimensions for the landing shall be 4 feet by 5 feet. The top of the landing shall be level with the threshold or opening of the doorway.
3. The semi-trailer may be connected to the QA lab by a stable elevated walkway. The walkway shall be a minimum of 48 inches wide and contain handrails installed at 32 inches above the deck of the walkway. The walkway shall be constructed such that it is stable and the deck does not deform during use and allows for proper door operation. Walkway construction shall be approved by the Engineer.

All cost for furnishing, maintaining, and removing the storage unit including labor, equipment, and materials including any necessary walkways, landings, stairways, and handrails shall be included in the contract unit price per each for STORAGE UNIT.

GENERAL NOTES

The Contractor shall be required to mow the inslopes with a rotary mower to a height of 6 inches for a distance of 14 feet from the edge of the roadway (or shoulder) on SD 20 for the length of the project. This work will be completed to the satisfaction of the Engineer after all construction activities are completed. All costs associated with this work shall be incidental to the various contract items.

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INSLOPE TRANSITIONS (SD 20)

Inslope transitions will be required at one pipe location. Refer to Standard Plate 120.05 for details.

TABLE OF INSLOPE TRANSITIONS AT PIPE CULVERTS OR REINFORCED CONCRETE BOX CULVERTS (SD 20)

Station	L/R	Type
1158+00	L & R	1

SHRINKAGE FACTOR:

SD 25 - Embankment +30%
SD 20 – Embankment +40%

TABLE OF EXCAVATION QUANTITIES BY BALANCES (SD 25)

Station to	Station	Excavation (CuYd)	* Undercut (CuYd)	Total Excavation (CuYd)	** Waste (CuYd)
209+33.5	224+50	16049	6331	22380	12170
	Totals:	16049	6331	22380	12170

* The quantities for these items are in the Estimate of Quantities under their respective bid items.
** The quantities for these items are for information only.

TABLE OF UNCLASSIFIED EXCAVATION (SD 25)

Excavation	16049
Undercut	6331
Topsoil	2530
Salvaged Asphalt Mix and Granular Base Material (from cut sections)	3395
Salvaged Asphalt Mix and Granular Base Material (from transition areas)	607
Total	28912

PROCEDURES FOR DETERMINING UNCLASSIFIED EXCAVATION QUANTITY

When plan quantities are used for payment, the Unclassified Excavation quantity shall be used for final payment.

The following paragraphs are general earthwork information and information in regards to computing the Unclassified Excavation quantity when final cross sections are taken in the field:

The Topsoil quantity in the Table of Unclassified Excavation is an estimate. When finaling a project, the total quantity of field measured Topsoil shall be used in place of the estimated Topsoil quantity. The quantity of Topsoil from the cuts will be paid for twice as Unclassified Excavation, as it will be in both the Excavation and Topsoil quantities. This will be full compensation for Excavation, which includes necessary undercutting to provide space for placement of topsoil.

The Excavation quantities from individual balances and the Table of Unclassified Excavation have been reduced by the volume of in place surfacing that will be removed and/or salvaged.

Salvaged Asphalt Mix and Granular Base Material shall be paid for once as Unclassified Excavation. As shown in the Table of Unclassified Excavation, the estimated quantity of 607 cubic yards of Salvaged Asphalt Mix and Granular Base Material from transition areas shall be added to the Excavation quantity to determine the Unclassified Excavation quantity. When finaling a project, the quantity of Salvaged Asphalt Mix and Granular Base Material from transition areas will not be adjusted according to field measurements. The quantity of Salvaged Asphalt Mix and Granular Base Material from cut sections will not be added to the Excavation quantity as it is already in the cuts on the final cross sections.

INCIDENTAL WORK, GRADING

HWY	Station	L/R	Remarks
SD 25	211+40		Take out 18”-85’ RCP w/Flared Ends
	213+18-45’	L	Take out 18”-58’ RCP w/Sloped Ends
	221+55		Take out 18”-112’ RCP w/Flared Ends
SD 20	803+10		Take out 18”-80’ CMP
	830+90		Take out 30”-108’ CMP
	850+00		Take out 24”-86’ CMP
	896+00		Take out 24”-118’ CMP
	1043+00		Take out 24”-128’ CMP
	1115+00		Take out 18”-100’ CMP
	1116+20		Take out 18”-100’ CMP

Asphalt concrete and base course material removed from the work locations listed above shall become property of the Contractor for disposal.

CLEANOUT PIPE CULVERTS (SD 20)

At those culvert locations where Cleanout Pipe Culvert is required, as indicated on the Table of Mainline Culvert Work, the ditches at the inlet and outlet shall also be cleaned.

Cleanout of pipe culverts shall be done in advance of culvert repair operations. At those locations where further evaluation of culvert repairs are required, the culvert cleaning shall be scheduled such that there is adequate time to evaluate what repairs are required and allow for ordering and delivery of culvert materials.

Material in all existing culverts shall be cleaned out by water flushing or other approved methods.

Material removed from the culverts shall become the property of the Contractor for disposal.

The Contractor shall implement appropriate sediment control measures prior to water flushing in order to prevent discharges from the project boundaries to comply with the Storm Water Permit.

CORRUGATED METAL PIPE

The gauge of the corrugated metal ends shall be 16 gauge.

GENERAL MAINLINE TRANSVERSE CULVERT REPAIR AND REPLACEMENT (SD 20)

The location of the mainline cross pipe was taken from the original grading plans. The Contractor shall be responsible for locating the mainline cross pipe.

Prior to beginning culvert repair and replacement operations it may be necessary to dewater the work area. The area around the pipe inlet and outlets shall be blocked with sandbags wrapped in 6 mil polyethylene sheeting and dewatered. All costs associated with sandbagging and dewatering shall be incidental to the contract unit prices for the various pipe contract items. The pipe shall be installed in dry bedding.

The Contractor is encouraged to thoroughly investigate the culvert repair sites prior to bidding. Prior to working on the sites that are inundated with water, a complete dewatering plan shall be submitted for approval to the Engineer. No separate payment for dewatering will be made.

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GENERAL MAINLINE TRANSVERSE CULVERT REPAIR AND REPLACEMENT (SD 20) (CONTINUED)

Prior to beginning culvert work at all work locations, the Contractor shall remove and stockpile 3 inches of in place topsoil from the construction areas. On completion of construction operations this salvaged topsoil shall be spread evenly over the embankment at the work sites.

Fill material shall be obtained from Contractor furnished sources and approved by the Engineer.

Compaction of inslope embankments shall be to the satisfaction of the Engineer.

It is not anticipated that water for compaction will be required. However, if in the opinion of the Engineer the fill material is extremely dry, water may be ordered and placed to the satisfaction of the Engineer. All costs for any added water shall be incidental to the contract unit price per cubic yard for CONTRACTOR FURNISHED BORROW EXCAVATION.

Haul of embankment material on established traveled roadways shall be limited to trucks hauling legal loads and which do not sustain damage to the roadway, as approved by the Engineer. Hauling of material in the roadway ditches will not be allowed.

Additional excavation may be required to ensure positive drainage into and out of extended culverts. Excavated material shall be incorporated into the embankment slope.

The Contractor shall be responsible for restoration of any areas disturbed outside the limits of the work area.

RCP AND CMP CULVERT REPAIRS FOR MAINLINE CULVERTS (SD 20)

All pipe and end treatments designated for removal shall become the property of the Contractor for his disposal.

Tie bolts shall be installed at all joint locations where existing pipe sections and end treatments are being reset or installed new. This may require drilling holes into the existing pipe sections and end treatments. Tie bolts shall be installed in accordance with Standard Plate No. 450.18. New RCP culvert installations shall have all the joint locations tied together with tie bolts.

When cutting CMP culverts to add end sections, the culvert may be cut with a torch. If the culvert is cut the damaged area shall be painted with a galvanizing paint approved by the Engineer. All costs associated with cutting and painting shall be incidental to the various contract items.

The Contractor is advised of the risk of lead exposure when cutting galvanized paint. The Contractor should plan his/her operations accordingly, and inform employees of hazards of lead exposure.

Joints between concrete pipe culvert sections shall be protected against infiltration as indicated in Section 450.3 A of the Specifications. If an existing concrete pipe culvert section has a damaged joint or there is poor alignment of the joints, 2 layers of drainage fabric shall be placed over the joint.

Culvert barrel and culvert end treatments that are to be removed and reset shall be cleaned prior to resetting. There will be no payment of the contract item Cleanout Pipe Culvert to clean sections of culverts that are removed and reset.

It is the responsibility of the Contractor to visit the sites to determine the extent of culvert cleaning work required.

The Contractor shall implement appropriate sediment control measures prior to water flushing in order to prevent discharges from project boundaries to comply with the Storm Water Permit.

The Contractor shall be responsible for properly disposing of the removed materials.

MAINLINE CROSS PIPE REPLACEMENT (SD 20)

It will be necessary to construct dikes/cofferdams in order to provide dry installation of the pipe. The Contractor may propose alternate methods of installation for the Engineer's approval. If alternate methods are proposed, the Contractor shall submit a written plan with detail to the Engineer a minimum of one week prior to the Preconstruction meeting. All costs associated to furnish, construct, backfill, and remove the dikes shall be incidental to the various contract unit prices for pipe.

After the existing pipe has been removed, the new pipe culvert shall be undercut to a minimum depth of 1 foot and backfilled with base course. The depth of undercut is an estimate and the actual depth necessary shall be determined during construction. The Engineer will determine how much undercut shall be done in accordance with Section 421 of the Specifications, but will not reduce the undercut to less than 1 foot in depth. Compaction of the undercut backfill will be in accordance with Section 421.3 A.

The culvert will be bedded in accordance with Section 450.3 F.2, Class B Bedding with the following exception. The undercut area shall extend 2 feet from the outermost diameter on both sides of the pipe with the back of the excavated area being sloped 3:1 upward to the top of the roadway surface. The Select Granular Backfill for the Class B Bedding will conform to the specification for Base Course. See Culvert Replacement Detail.

The remainder of the pipe culvert excavation shall be backfilled with soils taken from the pipe removal excavation or other suitable material as approved by the Engineer. The backfill will be benched into 3:1 excavation slope. Compaction of the backfill material shall be governed by the Specified Density Method.

The minimum testing as shown in M.S.T.R Section 4.1.F will be required.

After the new pipe has been backfilled to the top of the subgrade, a 12'" depth of base course and 5" depth (2- 2.5" lifts) of asphalt concrete composite shall be placed as a patch matching the existing asphalt concrete.

All costs to saw cut asphalt, remove and dispose of asphalt, excavate and backfill the material to the bottom of the pipe and slope the excavating limits at a 3:1 backslope shall be paid for at the contract unit price per cubic yard for UNCLASSIFIED EXCAVATION. Pipe Culvert Undercut shall be paid for at the contract unit price per cubic yard for PIPE CULVERT UNDERCUT. No additional payment will be made for asphalt removal, excavation, or disposal of material to accommodate temporary channel diversions or pipes. Base course for the undercut backfill will be paid for at the contract unit price per ton for BASE COURSE.

The cost for asphalt concrete composite installed over the pipe replacement shall be paid for at the contract unit price per ton for ASPHALT CONCRETE COMPOSITE.

Pipe flowline shall match that of existing pipe. This may require that ditches be excavated in each direction from the pipe ends to maintain proper water flow through the pipe. The excavated material shall become the property of the Contractor for his disposal. All costs associated with this work shall be incidental to the contract lump sum price for INCIDENTAL WORK, GRADING.

MAINLINE CROSS PIPE REPLACEMENT (SD 25)

After the existing pipe has been removed, the new pipe culvert shall be undercut to a minimum depth of 1 foot and backfilled with base course. The depth of undercut is an estimate and the actual depth necessary shall be determined during construction. The Engineer will determine how much undercut shall be done in accordance with Section 421 of the Specifications, but will not reduce the undercut to less than 1 foot in depth. Compaction of the undercut backfill will be in accordance with Section 421.3 A.

The minimum testing as shown in M.S.T.R Section 4.1.F will be required.

Base course for the undercut backfill will be paid for at the contract unit price per ton for BASE COURSE.

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TABLE OF MAINLINE CULVERT REPLACEMENT EXCAVATION AND SURFACING QUANTITIES

HWY	Station	Unclassified Excavation (CuYd)	Base Course for Culvert Undercut & Bedding (Ton)	Base Course for Surfacing (12" Depth) (Ton)	Asphalt Concrete Composite (5" Depth) (Ton)
SD25	211+40		130		
	221+55		130		
	Total		260		
SD20	803+10	275	85	175	57
	830+90	930	140	260	84
	850+00	750	105	230	75
	896+00	1330	130	240	90
	1043+00	1410	140	285	93
	1115+00	750	135	270	87
	1116+20	570	105	220	70
	Total:	6015	840	1680	556

Ditch cleanout at the replaced culverts on SD 20 shall extend from the end of the culvert to within 1 foot of the Right-of-Way (ROW) Line. The bottom of the ditch cleanout shall be a minimum of 10 feet wide and the side slopes on the channel shall be 20:1 or flatter. For those locations where there is no channel from the inlet/outlet of the culvert to the ROW Line ditch cleanout shall be completed such that there is a flat area of 100 Square Feet created at the inlet/outlet and the sides slopes around the flat area shall be 20:1 or flatter. Ditch cleanout material may be incorporated into the inslope, subject to approval by the Engineer. Ditch cleanout shall be incidental to the contract lump sum price for INCIDENTAL WORK, GRADING.

TABLE OF PIPE CULVERT UNDERCUT

The Table of Pipe Culvert Undercut is intended to be used to establish an estimated quantity of Pipe Culvert Undercut for bidding purposes only. The depth of undercut is an estimate and the actual depth necessary shall be determined during construction. The Engineer will determine undercut in accordance with Section 421 of the Specifications.

HWY	Station	Undercut Depth (Ft)	Quantity (CuYd)
SD 25	211+40	1	26.6
	221+55	1	28.9
		Total	55.5
SD 20	803+10	1	19.3
	830+90	1	28.7
	850+00	1	23.7
	896+00	1	29.5
	1043+00	1	30.9
	1115+00	1	24.7
	1116+20	1	24.1
		Total:	180.9

The table contains the rate of pipe culvert undercut per foot of pipe length and should be used as an aid in determining the actual amount of undercut to be performed during construction. The table is derived from the Culvert Replacement Detail and conforms to the Specifications. When calculating pipe culvert undercut, the length of pipe ends should be included in the overall pipe length.

Approach pipes do not require undercutting unless specified otherwise in these plans.

Pipe Diameter (In)	Round Pipe Undercut Rate for 1' Depth (CuYd/Ft)	Arch Pipe Undercut Rate for 1' Depth (CuYd/Ft)
24	0.2407	0.2577
30	0.2623	0.2847
36	0.2840	0.3110
42	0.3056	0.3337
48	0.3272	0.3596
54	0.3488	0.3827
60	0.3704	0.4105
66	0.3920	---
72	0.4136	0.4630
78	0.4352	---

CONTRACTOR FURNISHED BORROW EXCAVATION (SD 20)

The Contractor shall provide a suitable site for Contractor furnished borrow excavation material. The Contractor is responsible for obtaining all required permits and clearances for the borrow site. The borrow material shall be approved by the Engineer. A quantity of 2350 cubic yards of Contractor Furnished Borrow Excavation has been included in the Estimate of Quantities for use at culvert replacement sites, should the excavated material be determined not suitable for reuse.

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

GEOGRID REINFORCEMENT (SD 20)

Geogrid shall be placed at culvert replacement sites, between the first and second lifts of the Base Course. 2087 sq. yds of geogrid have been included in the Estimate of Quantities. This quantity is assumed to cover 1988 sq. yds. The grid quantity has been increased by 5% to account for overlaps.

SD 20 Station	Width of Geogrid Placement (Ft)	Length of Geogrid Placement (Ft)	Quantity of Geogrid (SqYd)
803+10	36	50	210.0
830+90	36	75	315.0
850+00	36	67	281.4
896+00	36	81	340.2
1043+00	36	83	348.6
1115+00	36	78	327.6
1116+20	36	63	264.6
		Total:	2087.4

Geogrid Specification:

The geogrid will be a biaxial grid of single layer construction. Vibratory welded, integrally formed or woven and coated geogrids will be acceptable. Grids with laser welded grid junctions will not be allowed. The geogrid will be certified by the supplier to meet the following specification prior to installation:

Property	Test	MARV
Wide Width Strip Tensile Strength (Ultimate)	ASTM6637 Method B	850lb/ft MD and XD

Geogrid will be paid for at the contract unit price per sq. yd. To account for overlaps the payment quantities will be based on area covered plus 5%. Payment will be full compensation for furnishing and installing the geogrid only.

Installation Procedure:

- The geogrid should be kept as taut as possible.
- Base Course will be dumped at least 20 feet behind the leading edge of the fill and pushed into place with a loader or dozer.
- No equipment shall be allowed to operate directly on the geogrid.
- All seams in the geogrid will be overlapped at least 1 foot and in a manner that prevents Base Course being pushed under the geogrid.
- Geogrid will be unrolled parallel to centerline.

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BANK AND CHANNEL PROTECTION GABION

Gabion installation shall not extend beyond the Right of Way. Gabions at Sta. 1043+00 on SD 20 shall to be shortened by one cell (3 feet) at this location.

All other Gabion installation shall be in accordance with Standard Plate 720.03.

ASPHALT CONCRETE COMPOSITE (SD 20)

Asphalt Concrete Composite shall be paver laid in lifts not exceeding 2.5" in depth.

All other requirements in the specifications for Asphalt Concrete Composite shall apply.

REINFORCED CONCRETE PIPE JOINT REPAIR AND VOID GROUTING (SD 20)

A. CULVERT JOINT CLEANING

1. This work shall 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 shall be clean and dry and most notably the specified joints shall 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 shall dispose of all debris removed from the culverts during the cleaning operation as approved by the Engineer.

2. All costs for equipment, material and labor for the culvert joint cleaning work shall be incidental to the contract unit price per foot for CULVERT JOINT CLEANING which shall be compensation in full for all equipment.

3. Contractor shall visit the project to determine the extent of cleaning needed for Culvert Joint Cleaning prior to bidding work.

B. REPAIR CULVERT JOINT

This work shall consist of repairing culvert joints in accordance with the Chemical Grout Manufacturer's directions for the sealing of each joint to prevent future infiltration/exfiltration of soils and water. Joint Sealing also prevents the soil stabilization and void filling grout from expanding back into the structure during injection. The following shall apply:

1. The work shall consist of repairing the concrete culvert joint with a sealant comprised of water reactive hydrophilic polyurethane resin and dry oil free oakum. The work shall include the furnishing by the Contractor, of all supervision, training, labor, materials, tools, lighting and equipment for the performance of all operations necessary to repair or seal joints between concrete pipe sections throughout the culvert. All grout will be injected under such pressure so as not to damage the existing drainage structure or roadway structure.
2. The Contractor shall provide a notarized statement, from the Manufacturer, that the polyurethane foam resin meets the specified requirements, along with submitting the Manufacturer's current product specification and installation instructions. The grout materials shall be non-flammable and non-toxic when cured.

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

4. 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.

5. The Contractor shall follow the Manufacturer's installation instructions throughout the repair process and install components in accordance with Manufacturer's specifications.

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

7. Temperature of the resin 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.

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

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

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

GEL FOAM II (For Saturating Oakum Rope Joint Packing Material) 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.

11. UV Protection (Gel Coat) – The work shall consist of trimming excess grout and oakum from the interior face of the joint prior to applying the Gel Coat. The epoxy gel compound shall be recommended by the Manufacturer for both surface sealing and protecting the hydrophilic grout from UV exposure. The epoxy gel compound shall be mixed and handled in accordance with the Manufacturer's recommendations and shall meet the following requirements:

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

12. All costs for all equipment, material and labor required to complete the work shall 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 resin 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.

13. Contractor shall visit the project to determine the extent of work needed for Repairing the Culvert Joints prior to bidding the work.

C. DUAL COMPONENT CHEMICAL GROUT FOR VOID FILLING

1. This work shall consist of filling external voids surrounding the culvert, with an injected high expansion chemical grout compound. The work shall include furnishing the chemical grout by the Contractor, all supervision, training, labor, materials, tools, lighting and equipment for the performance of all operations necessary to fill external voids around the drainage structure. Holes shall 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). All grout shall be injected under such pressure so as not to damage the existing drainage structure or roadway structure. All joints shall 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 shall be properly sealed.

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

3. The Contractor shall provide a notarized statement, from the Manufacturer, that the polyurethane foam resin meets the specified requirements for filling voids, along with submitting the Manufacturer's current product specification and installation instructions.

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REINFORCED CONCRETE PIPE JOINT REPAIR AND VOID GROUTING (SD 20) (CONTINUED)

4. The Contractor shall follow the Manufacturer's installation instructions throughout the repair process and install components in accordance with Manufacturer's specifications.

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

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

7. The Contractor shall provide worker and inspector safety and worker protective gear in accordance with the Manufacturer, including but not limited to chemical goggles, face shields, eye wash system, Tyvek or equivalent clothing protection and NBR gloves.

8. 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 on any of this work.

9. The chemical grout or void filling materials shall be a dual component hydrophobic polyurethane grout compound.

10. The grout materials shall be non-flammable and non-toxic when cured.

11. The grout mixture shall have expansion properties listed in the data sheets of greater than twenty (20) times its original volume and cure to rigid closed cell polyurethane foam. The grout shall expand to fill any voids and bond to the exterior surface of the structure. VF dual component polyurethane grouts as manufactured by Green Mountain International LLC or equal.

12. It is the Contractor's responsibility to locate reinforcing bars and conduit prior to drilling any grout holes.

13. The typical method consists of placing a layer of chemical grout behind or around the structure. The Contractor shall 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 shall 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.

TEMPERATURE of the resin 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 and 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.

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. After the grout cures, excess material shall be trimmed to be flush with the pipe interior wall and the pipe left clean.

14. All costs for filling external voids surrounding the culvert shall be incidental to the contract unit price per gallon for CHEMICAL GROUT VOID FILL for all equipment, intermediate and post cleanup, material and labor required to complete the work. Any overfilling of voids that results in damage to overlying pavement, highway user ride quality, or drainage structure integrity shall be corrected by the Contractor at no expense to the Owner. All corrections shall be approved by the Engineer.

15. Contractor shall visit the project to determine the extent of work needed for the Grout Void Fill prior to bidding the work.

INSTALLING 24" RCP IN EXISTING RC CATTLE PASS (SD 20)

The Contractor shall install 24" RCP through the existing 4' x 6' RC Cattle Pass at sta. 1158+00. Prior to installing the RCP, the end sections of the existing cattle pass shall be removed and become property of the Contractor.

An all-weather roof cement shall be used to fill the gaps in the joints between the RCP section where the joints will be encased by Controlled Density Fill. The roof cement shall be allowed to cure prior to encasing with Controlled Density Fill. All costs associated with the all-weather roof cement shall be incidental to the contract unit price for the various RCP contract items.

The 24" RCP, Controlled Density Fill and Contractor Furnished Borrow Excavation shall be placed as shown in the Details for Installing 24" RCP in Existing RC Cattle Pass.

The quantities for RCP, Controlled Density Fill and Contractor Furnished Borrow are shown in the Table of Mainline Culvert Work.

Contractor Furnished Borrow Excavation shall be placed and compacted to eliminate settlement and voids at the ends of the removed RC Cattle Pass End Section. The Contractor Furnished Borrow Excavation shall be placed to create a 4:1 inslope in the vicinity of the RC Cattle Pass.

CONTROLLED DENSITY FILL (SD 20)

Controlled density fill shall be placed at sta. 1158+00 on SD 20.

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

The Contractor shall prevent the floatation, uplift or movement of the culvert due to the buoyant force from the controlled density fill until the controlled density fill hardens.

The Contractor shall be responsible for removing any controlled density fill from within the barrel of the newly installed RCP.

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

Plans quantity will be the basis of payment unless otherwise ordered by the Engineer.

SALVAGE AND STOCKPILE ASPHALT MIX AND GRANULAR BASE MATERIAL (SD 25)

An estimated 7563.8 tons (4002 Cubic Yards) of asphalt mix and granular base material shall be salvaged from the entire length of the existing highway and transition areas to be stockpiled at a site furnished by the Contractor and satisfactory to the Engineer.

Salvaged material shall be processed to provide material meeting the following gradation:

Sieve Size	% Passing
2 inch (50.0 mm)	100
1 inch (25.0 mm)	70-100

The quantity of salvage asphalt mix and granular base material may vary from the plans. No adjustment will be made to the contract unit price for variations of the quantity of SALVAGE AND STOCKPILE ASPHALT MIX AND GRANULAR BASE MATERIAL.

SALVAGED MATERIAL (SD 25)

The quantity of salvaged asphalt mix and granular base material may vary from the plans. An estimated 6217.3 tons of salvaged material will be used on the project as Base Course, Salvaged. The remaining salvaged material, estimated at 1346.5 tons, shall be stockpiled for future use. Refer to the Haul and Stockpile Granular Material notes.

No adjustment in the contract unit price for salvage material will be made because of a variation in salvaged material quantities.

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BASE COURSE, SALVAGED

The Base Course, Salvaged shall be obtained from the stockpiles provided by the Contractor and may be used without further testing.

All other requirements for Base Course, Salvaged shall apply.

HAUL AND STOCKPILE GRANULAR MATERIAL

The remaining 1346.5 Tons of Base Course, Salvaged not used on SD 25 shall be hauled and stockpiled as directed by the Engineer to the weight station at the intersection of SD 25 and SD 20 (SW1/4 SEC 23 T119N R 56W) and will be paid per the contract unit price per ton for HAUL AND STOCKPILE GRANULAR MATERIAL.

DUST CONTROL CHLORIDE (SD 25)

The Contractor shall provide a magnesium chloride solution to be applied after the placement of Base Course, Savaged. Dust Control material shall be applied 30 feet wide at a rate of 1.2 pounds per square yard.

The application of dust control material shall be rolled with a pneumatic roller for a minimum of 3 coverages.

BASE COURSE

Included in the Estimate of Quantities are **100** tons of Base Course per mile for backfill of Unclassified Excavation, Digouts.

SHOULDER PREPARATION

Vegetation and accumulated material adjacent to the existing surface edge shall be removed to the satisfaction of the Engineer prior to placement of mainline surfacing. Any remaining windrow of accumulated material shall be re-spread evenly on the inslope adjacent to the asphalt shoulder to the satisfaction of the Engineer prior to the application of the flush seal.

Any vegetation damaged outside of the asphalt concrete limits shall be repaired and/or restored by the Contractor, at no expense to the State, and to the satisfaction of the Engineer.

This shoulder work shall be incidental to other contract items. Separate measurement and payment will not be made.

Prior to construction, State Maintenance Forces will spray the shoulders to kill existing vegetation. It will be the Contractor's responsibility to notify the State at least 30 days in advance of when he plans to begin work on the surface of the highway. The State assumes no responsibility for the effectiveness of the herbicide applied.

INTERSECTING ROADS AND ENTRANCES

Intersecting roads and entrances shall be satisfactorily cleared of vegetation, shaped, and compacted prior to placement of mainline surfacing. This work will be considered incidental to other contract items. Separate measurement and payment will not be made.

EXCAVATION OF UNSTABLE MATERIAL

Included in the Estimate of Quantities are **50** Cubic Yards of Unclassified Excavation, Digouts per mile for the necessary removal of unstable material.

Backfill shall be Base Course paid for at the contract unit price per ton.

The digout shall be extended to the shoulder and the granular material backfill shall daylight to the inslope to allow water to escape the subgrade.

A copy of the surfacing/subgrade investigation for this project is available from the Huron Area and the Aberdeen Region offices.

WATER FOR COMPACTION OF GRANULAR MATERIALS

Water for compaction of Base Course and Base Course, Salvaged materials on SD 25 shall be in accordance with the Rates of Materials.

Cost of water for compaction of the granular material on SD 20 shall be incidental to the contract unit price for the various contract items. Six percent, plus or minus, moisture will be required at the time of compaction unless otherwise directed by the Engineer.

ASPHALT FOR TACK

Included in the Estimate of Quantities are **9.0** tons of SS-1h or CSS-1h Asphalt for Tack for surface repair, strengthening, and spot leveling areas throughout the project on SD 20. (Rate = 0.09 Gal./ Sq.Yd.).

CLASS Q2 HOT MIXED ASPHALT CONCRETE

Mineral Aggregate for Class Q2 Hot Mixed Asphalt Concrete shall conform to the requirements of Class Q2.

ADDITIONAL QUANTITIES:

Included in the Estimate of Quantities are **400** tons of Class **Q2** Asphalt Concrete and, **4.0** tons of Hydrated Lime of Asphalt concrete and **23.2** tons of PG **64-28** Asphalt Binder, per mile for spot leveling, strengthening, and repair of the existing surface on SD 20. This material shall be placed where and as directed by the Engineer.

FLUSH SEAL

Application of Flush Seal shall be completed within 10 working days following completion of the asphalt concrete surfacing.

For each working day that the Flush Seal remains uncompleted after the 10 working day limitation, the Contractor will be assessed liquidated damages at the rate of $250.00 per day.

The liquidated damages shall apply only up to the Substantial Completion Date, as extended. After the Substantial Completion Date, liquidated damages will be assessed in accordance with the schedule set forth in section 8.8 of the specifications.

Application of Flush Seal may be eliminated by the Engineer. If the paved surface remains tight, the Engineer shall notify the Contractor as soon as possible that the Flush Seal is unnecessary.

SAND FOR FLUSH SEAL

The sand application shall be placed 11' wide in each lane, leaving 12" on center line and 6" on each edge line free of sand.

COLD MILLING ASPHALT CONCRETE (SD 20)

The cold milled material obtained from the project shall become the property of the Contractor. Gradation testing of cold milled material not utilized on the project shall not be required, unless deemed necessary by the Engineer.

Cold milled material which remains on the project shall be subjected to gradation testing.

The placement of asphalt concrete shall begin within **5** working days after completion of cold milling of mainline asphalt concrete. The Contractor shall be responsible maintaining the temporary ramps at the project limits and intersecting roads.

REFURBISH MAILBOXES

Existing mailboxes shall be removed, turnouts constructed, and mailboxes reset on new posts with the necessary support hardware for single mailbox assemblies (See Standard Plate No's. 900.02 and 900.03). The local Postmaster will determine the recommended mounting height of the mailboxes throughout the project. The Contractor shall coordinate with the Engineer on the proper postal representative to contact.

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TABLE OF REFURBISH MAILBOXES

Location MRM	SIDE	SINGLE MAILBOX EACH	COMMENT
SD 25			
164.00+0.805	West	1	
TOTALS		1	
SD 20			
364.00+0.700	South	1	
365.00+0.560	North	1	
366.00+0.840	South	1	
368.00+0.350	South	1	
369.00+0.750	South	1	
372.00+0.330	South	1	
TOTALS		6	

All costs for removing existing mailboxes, providing temporary mailboxes, and resetting mailboxes with new posts and necessary support hardware shall be incidental to the contract unit price per each for REFURBISH SINGLE MAILBOX.

RUMBLE STRIPES

Rumble Stripe installation shall be completed prior to application of the Flush Seal and Permanent Pavement Markings. In the event the Flush Seal is eliminated from the contract, the Contractor will still be required to apply a Flush Seal to the newly installed 8” Rumble Stripes at a width of 1.0’ and at the same rate as specified in this plan set. No adjustment in the contract unit price will be made and SS-1h or CSS-1h will be paid at the contract unit price per ton.

The Contractor shall be required to remove loose material from the driving surface and/or asphalt shoulders of the roadway. Loose material may be broomed to the edge of shoulders and it shall be the Contractor’s responsibility to ensure the loose material does not enter any vegetated areas and/or waterways.

Rumble Stripes shall not overlap the Rumble Strips that will be installed at the junction with SD 25 as detailed in the Recessed Rumble Strip Layout.

All costs associated with the work shall be incidental to the contract unit price per mile for GRIND 8" RUMBLE STRIP OR STRIPE IN ASPHALT CONCRETE.

TABLE OF 8” RUMBLE STRIPES

HWY, Station to Station	Length (Ft)	Length (Miles)
SD 25, 212+00 to 225+50 (Both Shoulders)	3,500	0.7
Total	3,500	0.7
SD 20, 694+10 to 1167+00 (Both Shoulders)	94,580.0	17.9
Total	94,580.0	17.9

RUMBLE STRIPS AT SD 25 JUNCTION

Rumble Strip installation shall be completed prior to application of the Flush Seal and Permanent Pavement Markings.

The Contractor shall grind rumble strips in the asphalt concrete on SD 20 at the SD 25 Junction according to the detail Recessed Rumble Strip Layout.

All costs for installing rumble strips shall be incidental to the contract unit price per foot for GROOVE 6” WIDE RUMBLE STRIP. Basis of Payment shall be plans quantity.

In the event the Flush Seal is eliminated from the contract, the Contractor will still be required to apply a Flush Seal to the newly installed rumble strips at the same rate as specified in this plan set. No adjustment in the contract unit price will be made and SS-1h or CSS-1h will be paid at the contract unit price per ton.

BRACE PANELS FOR ROW FENCE (SD 25)

The E-Z Brace or an approved equal may be utilized as an alternate horizontal brace in the brace panels if approved by the Engineer. The E-Z Brace shall be attached to each wood post utilizing two 5/16” x 3” lag screws. Holes of appropriate diameter, based on wood post condition, shall be drilled before placement of lag screws. The following are contacts regarding the E-Z Brace:

Roger Papka
E-Z Brace
1160 Karen St.
Watertown, SD 57201
605-881-6142

Dennis Mack
E-Z Brace
108 18th St. NE
Watertown, SD 57201
605-881-4990

TEMPORARY AND PERMANENT PAVEMENT MARKINGS

Maintaining size, shape, and dimension of existing pavement markings shall be the responsibility of the Contractor for both temporary and permanent pavement marking applications.

Temporary Flexible Vertical Markers (Tabs) shall be used to mark dashed centerline, No Passing Zones and applicable lane lines. Paint will not be allowed for Temporary Pavement Marking on the Asphalt Concrete Class Q2 Hot Mixed Asphalt Concrete wear course or after application of the Flush Seal.

The following item shall be reproduced with the Permanent Pavement Markings:
STOP Bars on SD 20 at the junction with SD 25. (Cold Applied Plastic Pavement Marking).

TEMPORARY PAVEMENT MARKINGS

The total length of no passing zone on SD 20 is estimated to be **3.7** miles, and **0.5** miles on SD 25.

The number of no passing zones on SD 20 is **23** and the number of no passing zones on SD 25 is **3**.

Quantities of Temporary Pavement Markings consist of:
- One pass on top of the Primed Surface. SD 25 Only
- One pass on top of the 1st Lift of Asphalt Concrete. SD 25 Only
- One pass on top of the 2nd Lift of Asphalt Concrete. SD 25 Only
- One pass on top of Q2 Hot Asphalt Concrete Overlay. SD 20 Only
- One pass on top of the Flush Seal. SD 25 & SD 20

If the Flush Seal is eliminated, the application of the Temporary Pavement Marking on top of the Flush Seal will be eliminated. No adjustment in the contract unit price for Temporary Pavement Marking will be made because of a variation in quantities.

Temporary Flexible Vertical Markers (Tabs) may be used as detailed in the specifications. Covers on the tabs shall be sufficiently secured to prevent traffic from dislodging the cover and when removed, the covers shall be properly disposed. The Contractor shall remove and properly dispose of the tabs after Permanent Pavement Marking is applied. Method of removal shall be nondestructive to the road surface and shall be accomplished within one week of completion of the Permanent Pavement Marking.

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TEMPORARY PAVEMENT MARKINGS (CONTINUED)

Any Temporary Flexible Vertical Markers (Tabs) with covers removed before the flush seal shall be replaced prior to Flush Seal application.

Cost for furnishing, applying, removing and disposing of the Temporary Flexible Vertical Markers (Tabs) shall be included in the contract unit price per mile for TEMPORARY PAVEMENT MARKING.

Flagger symbol signs (W20-7) and flaggers, or a shadow vehicle with rotating yellow lights or strobe lights shall be positioned on the roadway shoulder in advance of workers for both directions of traffic during the installation of Temporary Flexible Vertical Markers (Tabs). The traffic control device used shall be moved to provide proper warning of the work operation. A Workers symbol sign (W21-1) shall be mounted on the rear of the shadow vehicle. The method of traffic control used by the Contractor for this work shall be approved by the Engineer.

PERMANENT PAVEMENT MARKING

Traffic Control shall be incidental to the cost of application. The striper and advance or trailing warning vehicle shall be equipped with flashing amber lights or advance warning arrow panel.

All materials shall be applied as per manufacturer's recommendations.

The Contractor shall advise the Engineer a minimum of 3 weeks prior to the application of the permanent pavement marking to allow the State to check and mark the location of no passing zones.

The application of Permanent Pavement Marking paint may not begin until 7 calendar days following completion of final surfacing (including Flush Seal if applied) and shall be completed within 14 calendar days following completion of the final surfacing.

For each working day the application of permanent pavement marking paint remains uncompleted beyond the time limits described in the preceding paragraph, the Contractor will be assessed liquidated damages at the rate of $250.00 per day.

The liquidated damages shall apply up to the Substantial Completion Date, as extended. After the completion date, liquidated damages will be assessed in accordance with section 8.8 of the specifications, until the permanent pavement marking is completed, even though the project may be open to traffic.

COLD WEATHER, WATERBORNE PAINT

Waterborne paint applied after October 15 shall be formulated as cold weather, waterborne paint and shall be applied in accordance with manufacturer's recommendations, including minimum temperature requirements.

Cold weather, waterborne paint shall conform to Section 980 of the Specifications except for the following:

980.1: Resin Binder shall be Fastrack™ XSR manufactured by Dow, or approved equal.

980.1 A. Quantitative Requirements:

Pigment, percent by weight: 60.0 – 63.0 for white and 58.5 – 61.5 for yellow.

Pigment, percent by weight; tested in accordance with ASTM D3723: 60.0 – 63.0 for white and 56.1 – 59.2 for yellow.

Non-volatile Vehicle, percent by weight; tested in accordance with NIST 141C (Method 4051.1): 41.5 minimum for white and 51.5 minimum for yellow.

GROOVE FOR PAVEMENT MARKING (SD 20)

The work shall generally consist of grooving the asphalt surface and subsequent application of cold applied plastic tape.

All surfaces receiving cold applied plastic pavement markings shall be grooved prior to application of the cold applied plastic pavement markings.

Groove cleaning: Grooves must be cleaned by using high pressure compressed air (90 psi minimum).

The cold applied plastic pavement marking tape shall be installed in accordance with the manufacturer's recommendations.

GENERAL PERMANENT SIGNING NOTES

Permanent sign locations shall be staked in the field by the Contractor and checked by the Engineer. The Contractor shall give the Engineer a minimum of one week to check staked locations prior to sign/post installation.

The Contractor shall be responsible for contacting South Dakota One Call to locate the utilities at the staked sign installation locations.

Prior to ordering sign posts, the Contractor shall verify post lengths. The height of the post shall not exceed the minimum height needed by more than 0.5 feet. Any portion that extends above the sign shall be cut off. No separate payment will be made for cutting the post or for that length cut off.

REMOVE EXISTING SIGNS

Existing signs within the project limits are summarized in the Sign Table. This table provides the approximate MRM location for each sign. Existing signs in the table are indicated to be removed and not reused.

All existing signs and hardware listed to be removed shall become the property of the Contractor.

Holes remaining from the removal of 4"x6" wood posts shall be backfilled and compacted with material placed in layers not to exceed 6 inches in depth.

All costs associated with the removal of existing signs, posts, hardware, and backfilling holes shall be incidental to the contract unit price per each for REMOVE TRAFFIC SIGN.

All existing sign posts and/or sign bases shall be removed in their entirety.

NEW PERMANENT SIGNING

New signs for installation are summarized in the Sign Table.

Sign Design

Signs shall be constructed as required per the Manual on Uniform Traffic Control Devices (MUTCD), the latest edition of "Standard Highway Signs", and as specified on the Special Sign Design sheets.

All upper/lower case letters and numerals shall be as required per the MUTCD, the latest edition of "Standard Highway Signs", and as illustrated on the Special Sign Design sheets.

The Contractor shall furnish the Aberdeen Region Traffic Engineer (P.O. Box 1767; Aberdeen, SD 57402) with a detailed sign layout sheet for each sign shown. These detailed sign layouts shall be approved by the Region Traffic Engineer prior to ordering the signs.

Sign Sheeting

All signs shall be manufactured in accordance with the sheeting manufacturer's recommendations utilizing a matched component system, including inks, electronic cuttable films, and protective overlay films. Digitally printed signs will not be accepted.

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NEW PERMANENT SIGNING (CONTINUED)

Sign Installation Hardware

Aluminum U-Channel stiffeners shall be used on all standard highway signs greater than 36 inches in width and shall conform to Alloy 6063-T6 or 6061-T6. The U-Channel shall be 2 inches in width and free of holes. The U-Channel stiffeners shall also be used to connect various signs together so that an entire sign assembly can be erected on a single installation.

Stiffeners may be fastened to signs by use of ¼ inch diameter drive rivets.

Refer to the Breakaway Sign Supports diagram for typical sign and stiffener details.

The Contractor shall use 3/8 inch diameter rust proof machine sign bolts, flat metal washers, neoprene washers (against the sign sheeting), lock washers, and nuts to fasten the sign to the channel aluminum and posts. A minimum of two bolts shall extend through each post.

All costs associated with furnishing and installing the new permanent signs, and with furnishing and installing stiffeners and hardware shall be incidental to the contract unit price per square foot for Flat Aluminum Sign, Nonremovable Copy High Intensity, or Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity.

SQUARE TUBE ANCHOR SLEEVE

The Contractor shall furnish and install new square tube anchor sleeve as follows:

2.5” x 18”, 12 Gauge square tube anchor sleeve, (or equivalent components as approved by the Engineer).

A 2.25” x 2.25” x 4’ perforated tube post (12 Gauge) shall be used as the anchor post for installation with the square tube anchor sleeve.

SQUARE TUBE POST SLEEVE

All 2.5” x 2.5” perforated tube post (10 Gauge) shall be sleeved with a 2 3/16” x 2 3/16”x4’ perforated tube post (10 Gauge).

WINGED SLIP BASE ANCHOR

The Contractor shall furnish and install new winged slip base anchor as required per the plans.

Winged slip base anchor shall be installed using direct drive method.

Winged slip base anchor shall consist of a slip base (upper), 48 inch long winged anchor (lower), and hardware kit.

MILEAGE REFERENCE MARKERS

MRMs (Mileage Reference Markers) are not to be disturbed. If an MRM is attached to a sign listed for replacement it shall be salvaged and reattached to the new sign in the same location. Payment for this work shall be incidental to the various signing contract items.

PLACING TOPSOIL (SD 25)

The thickness will be approximately 4 inches within the right-of-way and 6 inches on temporary easements.

The estimated amount of topsoil to be placed on SD 25 is as follows:

Station	to	Station	Topsoil (CuYd)
208+33.5		225+50	2530
		Total:	2530

REMOVE AND REPLACE TOPSOIL (SD 20)

Topsoil shall be salvaged and stockpiled prior to starting work in the following areas, inslope and ditch reshaping at sta. 1043+00-R to sta. 1048+75-R, and culvert replacement areas. Limits of this work, depth of salvage, and stockpile location will be directed by the Engineer. Following completion of construction, topsoil shall be spread evenly over the disturbed areas.

All costs associated with removing and replacing the topsoil along areas to be resurfaced shall be incidental to the contract lump sum price for REMOVE AND REPLACE TOPSOIL.

PLACING CONTRACTOR FURNISHED TOPSOIL (SD 20)

It is anticipated that a larger volume of topsoil will be needed than can be salvaged from the existing project on SD 20. The Contractor will be required to furnish and place 4 inches of topsoil on roadway inslope areas listed in the table of additional quantities.

All costs to furnish and place the topsoil shall be incidental to the contract unit price per cubic yard for PLACING CONTRACTOR FURNISHED TOPSOIL.

MYCORRHIZAL INOCULUM

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

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

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

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

Product	Manufacturer
MycoApply	Mycorrhizal Applications, Inc. Grants Pass, OR Phone: 1-866-476-7800 http://www.mycorrhizae.com/

FERTILIZING

The Contractor shall apply an all-natural slow release fertilizer prior to seeding. The all-natural fertilizer shall have a minimum guaranteed analysis of 4-6-4 and be USDA Certified BioBased. It should provide a minimum of 4% (N) nitrogen with a minimum water insoluble nitrogen (WIN) fraction of 3.2%, a minimum of 6% (P2O5) available phosphate, a minimum of 4% (K2O) soluble potash, and a maximum carbon to nitrogen ratio (C:N ratio) of 5:1. The all-natural fertilizer shall be free of weed-seed and pathogens accomplished through thermophilic composting, and not mechanical or chemical sterilization, to assure presence of beneficial soil microbiology. The fertilizer shall have a near neutral pH, a low salt index, a low biological oxygen demand, contain organic humic and fulvic acids, and have high aerobic organism counts. The fertilizer shall also be stable, free of bad odors, and be unattractive as a food source for animals. It should also be in a granular form that is easily spread.

The fertilizer shall be applied at a rate of 1,000 pounds per acre in accordance with the manufacturer’s recommended method of application.

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

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

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PERMANENT SEEDING

The areas to be seeded consist of all newly graded areas and culvert repair/replacement areas within the project limits except for the top of roadways and temporary easements under cultivation. An estimated area to be seeded is 0.50 acres on SD 20 and 3.90 acres on SD 25.

Type G Permanent Seed Mixture shall consist of the following:

Grass Species	Variety	Pure Live Seed (PLS) (Pounds/Acre)
Western Wheatgrass	Arriba, Flintlock, Rodan, Rosana	7
Switchgrass	Dacotah, Forestburg, Nebraska 28, Pathfinder, Summer, Sunburst, Trailblazer	3
Indiangrass	Holt, Tomahawk	3
Big Bluestem	Bison, Bonilla, Champ, Pawnee, Sunnyview	3
Oats or Spring Wheat: April through May; Winter Wheat: August through November		10
	Total:	26

MULCHING (GRASS HAY OR STRAW)

A quantity of **8** tons of Grass Hay or Straw Mulch has been added to the Estimate of Quantities on SD 25.

A quantity of **4** tons of Grass Hay or Straw Mulch has been added to the Estimate of Quantities for temporary erosion control on SD 20 at repair areas determined by the Engineer during construction.

EROSION CONTROL WATTLE

Erosion control wattles for restraining the flow of runoff and sediment shall 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 shall provide certification that the erosion control wattles do not contain noxious weed seeds.

Erosion control wattles shall remain on the project to decompose.

An additional quantity of 12" Diameter Erosion Control Wattles has been added to the Estimate of Quantities for temporary erosion and sediment control in highway ditch channels and as an alternative to low flow or high flow silt fence at wetland areas adjacent to the highway.

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

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

TABLE OF EROSION CONTROL WATTLE

HWY Station	L/R	Diameter (Inch)	Location	Quantity (Ft)
SD 25				
211+40	L	12	Culvert inlet	20
221+55	L	12	Culvert inlet	20
			Additional Quantity	60
			Total	100
SD 20				
803+10	R	12	Culvert inlet	20
830+90	L&R	12	Culvert ends	40
1043+00	L	12	Culvert inlet	20
1115+00	R	12	Culvert inlet	20
1116+20	R	12	Culvert inlet	20
1158+00	R	12	Culvert inlet	20
			Additional Quantity:	400
			Total:	540

HIGH FLOW SILT FENCE

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

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

High flow silt fence shall be placed at the 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.

A quantity of **260** ft of high flow silt fence has been added to the Estimate of Quantities for temporary sediment control on SD 20.

A quantity of **40** ft of high flow silt fence has been added to the Estimate of Quantities for temporary sediment control on SD 25.

TYPE 2 OBJECT MARKERS

In place pipe markers at all mainline cross pipe shall be removed. Removed signs and posts shall become the property of the Contractor for disposal.

New back to back object markers with new posts shall be install on each side of the roadway on the upstream traffic-flow side of the pipe as per Standard Plate 632.10. There are a total of 2 mainline cross pipe on SD 25 and 35 mainline cross pipe on SD 20 that require marking in this way.

All costs associated with removal of in place pipe markers and installation of new back to back object markers shall be incidental to the contract unit price per each for TYPE 2 OBJECT MARKER BACK TO BACK.

Mainline cross pipe with an outside dimension greater than 60" or multiple pipes with a combined width greater than 60 inches require 4 single sided object markers to be installed, 1 at each corner of pipe. Mainline cross pipe at the following locations shall be marked with 4 single sided object markers.

Sta	Pipe Size
781+90 (SD 20)	66" RCP

All costs associated with removal of in place pipe markers and installation of new single sided object marker shall be incidental to the contract unit price per each for TYPE 2 OBJECT MARKER.

PLOT SCALE - 1:200
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PLOT NAME - 1
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STORM WATER POLLUTION PREVENTION PLAN CHECKLIST

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

SITE DESCRIPTION (4.2 1)

- **Project Limits: See Title Sheet (4.2 1.b)**
- **Project Description: See Title Sheet (4.2 1.a.)**
- **Site Map(s): See Title Sheet and Plans (4.2 1.f. (1)-(6))**
- **Major Soil Disturbing Activities** (check all that apply)
  - ☐ Clearing and grubbing
  - ☒ Excavation/borrow
  - ☒ Grading and shaping
  - ☐ Filling
  - ☒ Cutting and filling
  - ☒ Other (describe): Culvert repair/replacement & Riprap
- **Total Project Area** 169 acres **(4.2 1.b.)**
- **Total Area To Be Disturbed** 6.6 acres **(4.2 1.b.)**
- **Existing Vegetative Cover (%)** 75%
- **Soil Properties:** AASHTO Soil Classification A-4, A-6, A-7 **(4.2 1. d.)**
- **Name of Receiving Water Body/Bodies** Unnamed streams & lakes **(4.2 1.e.)**

ORDER OF CONSTRUCTION ACTIVITIES (4.2 1.c.)

(Stabilization measures shall be initiated as soon as possible, but in no case later than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased. Initiation of final or temporary stabilization may exceed the 14-day limit if earth disturbing activities will be resumed within 21 days.)

PH 0025(77)164, PCN 04J6

- **Special sequencing requirements (**see sheet).
- **Remove and store topsoil.**
- **Stabilize disturbed areas with Erosion Control Wattles & Silt Fence, Etc..**
- **Complete grading operations.**
- **Place topsoil, permanent seed, mulch, etc. to finish graded areas for final stabilization.**
-

❖ **P 0020(124)363, PCN 025V**

- **Special sequencing requirements (**see sheet)
- **Remove and store topsoil.**
- **Stabilize disturbed areas with Erosion control Wattles, Silt Fence, Etc..**
- **Complete culvert replacement and repairs.**
- **Place topsoil, permanent seed, mulch, etc. to finish graded areas for final stabilization**.

EROSION AND SEDIMENT CONTROLS (4.2 2.a.(1)(a)-(f))

(Check all that apply)

- **Stabilization Practices (See Detail Plan Sheets)**
  - ☐ Temporary Seeding (Cover Crop Seeding)
  - ☒ Permanent Seeding
  - ☐ Sodding
  - ☐ Planting (Woody Vegetation for Soil Stabilization)
  - ☒ Mulching (Grass Hay or Straw)
  - ☐ Hydraulic Mulch (Wood Fiber Mulch)
  - ☐ Soil Stabilizer
  - ☐ Bonded Fiber Matrix
  - ☐ Erosion Control Blankets or Mats
  - ☐ Vegetation Buffer Strips
  - ☐ Roughened Surface (e.g. tracking)
  - ☒ Dust Control
  - ☐ Other:
- **Structural Temporary Erosion and Sediment Controls**
  - ☒ Silt Fence
  - ☐ Floating Silt Curtain
  - ☐ Straw Bale Check
  - ☐ Temporary Berm
  - ☐ Temporary Slope Drain
  - ☒ Straw Wattles or Rolls
  - ☐ Turf Reinforcement Mat
  - ☐ Rip Rap
  - ☒ Gabions
  - ☐ Rock Check Dams
  - ☐ Sediment Traps/Basins
  - ☐ Inlet Protection
  - ☐ Outlet Protection
  - ☐ Surface Inlet Protection (Area Drain)
  - ☐ Curb Inlet Protection
  - ☐ Stabilized Construction Entrances
  - ☐ Entrance/Exit Equipment Tire Wash
  - ☐ Interceptor Ditch
  - ☐ Concrete Washout Area
  - ☐ Temporary Diversion Channel
  - ☐ Work Platform
  - ☐ Temporary Water Barrier
  - ☐ Temporary Water Crossing
  - ☐ Other:
- **Wetland Avoidance**

  Will construction and/or erosion and sediment controls impinge on regulated wetlands? Yes ☒ No ☐ If yes, the structural and erosion and sediment controls have been included in the total project wetland impacts and have been included in the 404 permit process with the USACE.
- **Storm Water Management (4.2 2.b., (1) and (2))**

  Storm water management will be handled by temporary controls outlined in "EROSION AND SEDIMENT CONTROLS" above, and any permanent controls needed to meet permanent storm water management needs in the post construction period. Permanent controls will be shown on the plans and noted as permanent.
- **Other Storm Water Controls (4.2 2.c., (1) and (2))**
  - **Waste Disposal**

    All liquid waste materials will be collected and stored in sealed metal containers approved by the project engineer. 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 in the field office. The general contractor's representative responsible for the conduct of work on the site will be responsible for seeing 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 individual designated as the contractor's on-site representative 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 in a timely manner by a licensed waste management contractor or as required by any local regulations.

MAINTENANCE AND INSPECTION (4.2 3. and 4.2 4.)

- **Maintenance and Inspection Practices**
  - Inspections will be conducted at least one time per week and after a storm event of 0.50 inches or greater.
  - 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 in order to ensure the fabric is securely attached to the posts and that the posts are well anchored. Sediment buildup will be removed from the silt fence when it reaches $^{1}/_{3}$ of the height of the silt fence.
  - Sediment basins and traps will be checked. Sediment will be removed when depth reaches approximately 50 percent of the structure's capacity, and at the conclusion of the construction.
  - Check dams will be inspected for stability. Sediment will be removed when depth reaches ½ the height of the dam.
  - All seeded areas will be checked for bare spots, washouts, and vigorous growth free of significant weed infestations.
  - Inspection and maintenance reports will be prepared 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 site superintendent are responsible for inspections. Maintenance, 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.

NON-STORM WATER DISCHARGES (3.0)

The following non-storm water 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.

MATERIALS INVENTORY (4.2. 2.c.(2))

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 headings "EROSION AND SEDIMENT CONTROLS" and "SPILL PREVENTION" (check all that apply).

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

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SPILL PREVENTION (4.2 2.c.(2))

- **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 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.
    - Vegetation areas not essential to the construction project will be preserved and maintained as noted on the plans.
  - Hazardous Materials
    - Products will be kept in original containers unless the container is not resealable.
    - 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 storm water system or storm water 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 storm water runoff.

- **Product Specific Practices (6.8)**
  - 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 storm water. 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 areas on the site. These areas must be self contained and not connected to any storm water outlet of the site. Upon completion of construction washout areas will be properly stabilized.

- **Spill Control Practices (4.2 2 c.(2))**

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 clean up 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 clean up 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. The contractor is responsible for ensuring that the site superintendent has had appropriate training for hazardous materials handling, spill management, and cleanup.

- **Spill Response (4.2 2 c.(2))**

The primary objective in responding to a spill is to quickly contain the material(s) and prevent or minimize migration into storm water runoff and conveyance systems. If the release has impacted on-site storm water, it is critical to contain the released materials on-site and prevent their release into receiving waters. If a spill of pollutants threatens storm water 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 SD DENR.
- Personnel with primary responsibility for spill response and clean up 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.

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 DENR immediately **if any one of the following** conditions exists:
  - The discharge threatens or is in a position to threaten the waters of the state (surface water or ground water).
  - The discharge causes an immediate danger to human health or safety.
  - The discharge exceeds 25 gallons.
  - The discharge causes a sheen on surface water.
  - The discharge of any substance that exceeds the ground water quality standards of ARSD (Administrative Rules of South Dakota) chapter 74:51:01.
  - The discharge of any substance that exceeds the surface water quality standards of ARSD chapter 74:51:01.
  - The discharge of any substance that harms or threatens to harm wildlife or aquatic life.
  - The discharge of crude oil in field activities under SDCL (South Dakota Codified Laws) chapter 45-9 is greater than 1 barrel (42 gallons).

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

CONSTRUCTION CHANGES (4.4)

When changes are made to the construction project that will require alterations in the temporary erosion controls of the site, the Storm Water Pollution Prevention Plan (SWPPP) will be amended to provide appropriate protection to disturbed areas, all storm water structures, and adjacent waters. The SDDOT Project Engineer will modify the SWPPP plan (DOT 298) and drawings to reflect the needed changes. Copies of changes will be routed per DOT 298. Copies of forms and the SWPPP will be retained in a designated place for review over the course of the project.

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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 6.7.1.C.)

- **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

CONTACT INFORMATION

- **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: _____
- **SD DENR Contact Spill Reporting**
  - Business Hours Monday-Friday (605) 773-3296
  - Nights and Weekends (605) 773-3231
- **SD DENR Contact for Hazardous Materials.**
  - (605) 773-3153
- **National Response Center Hotline**
  - (800) 424-8802.

PLOT SCALE - 1:200
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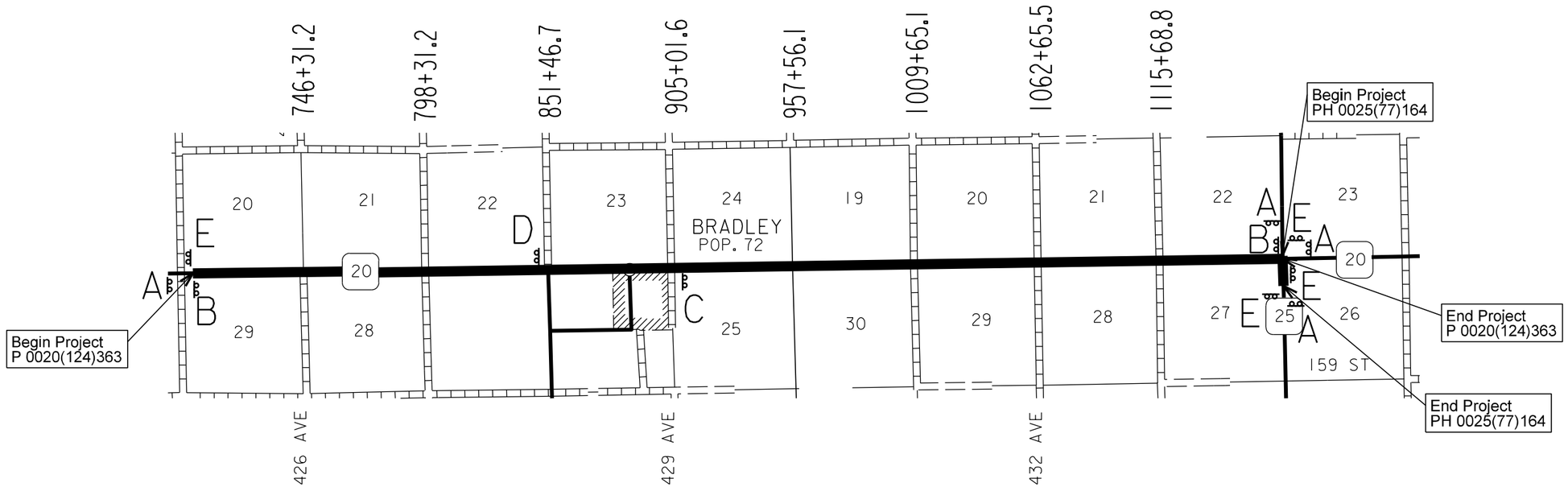
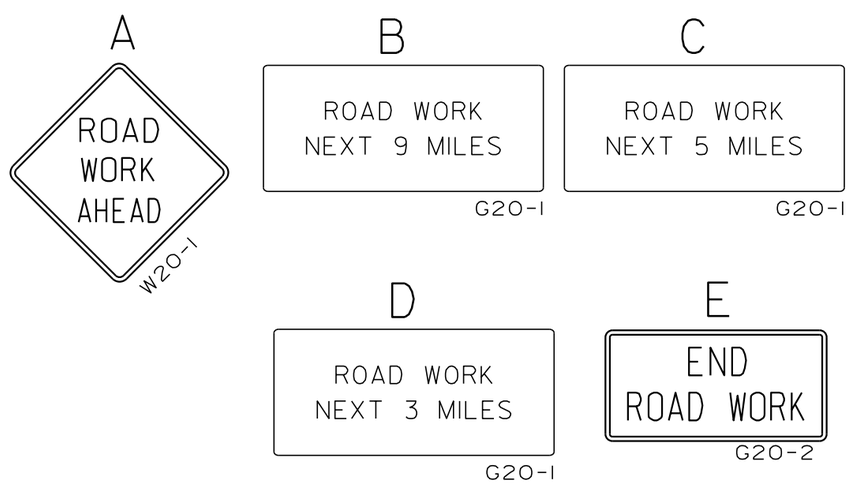
FIXED LOCATION GROUND MOUNTED BREAKAWAY SUPPORT SIGNS





W20-1 ROAD WORK AHEAD signs shall be mounted on portable supports, and shall be placed on intersecting roadways as directed by the Engineer. ROAD WORK AHEAD signs shall be moved as necessary to keep current with the work activities.

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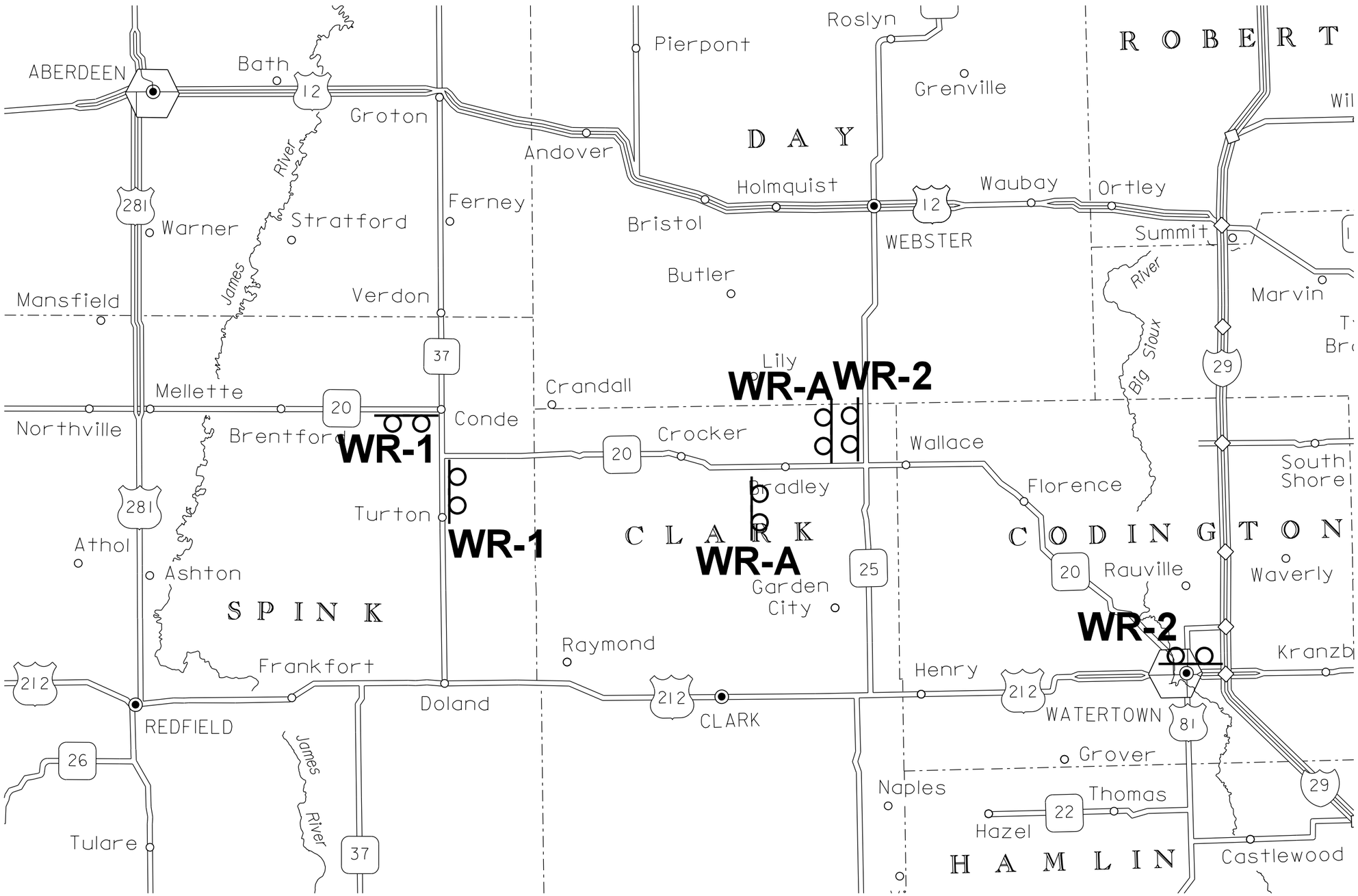
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0020(124)363	36	109

Plotting Date: 12/29/2015

Overwidth Sign Locations



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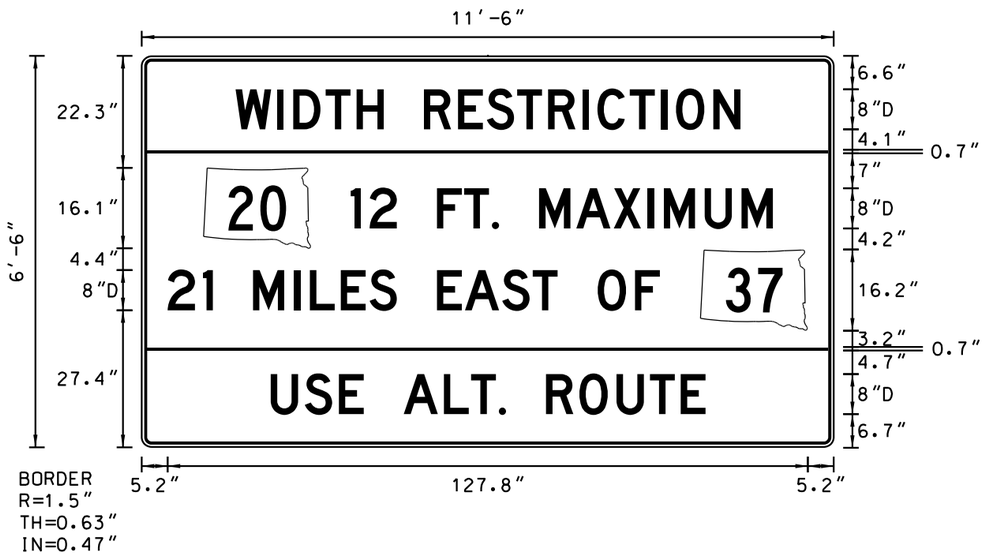
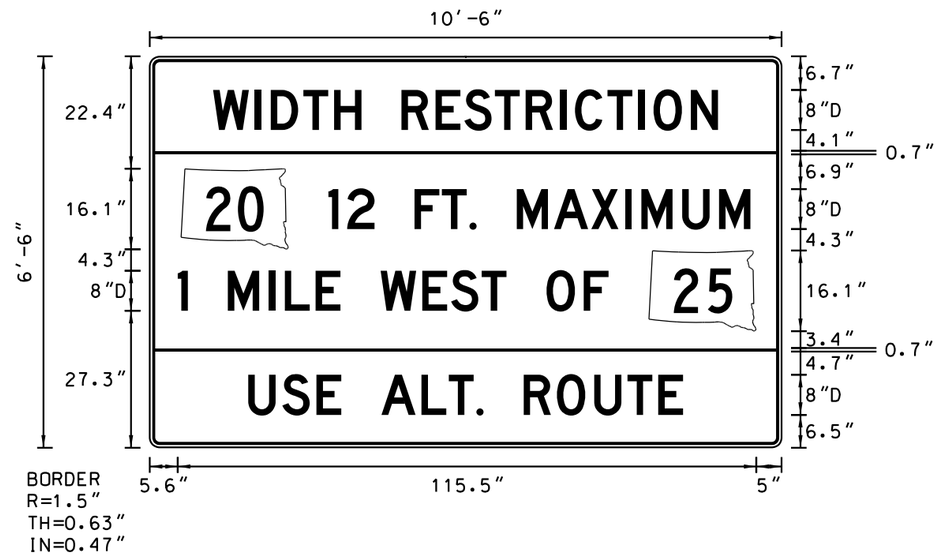
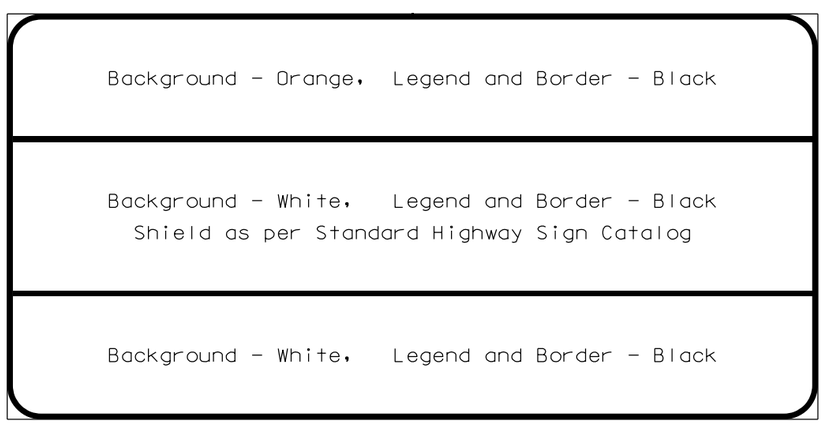
WR-1



WR-2



Typical Layout



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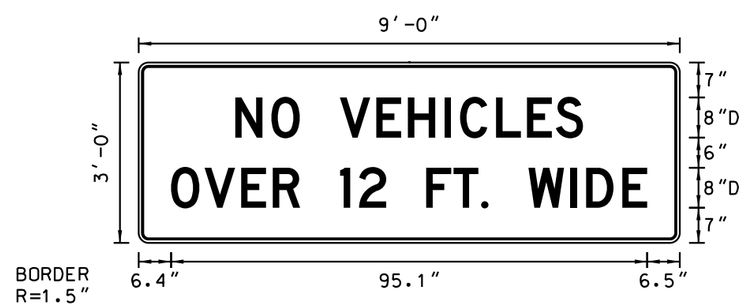

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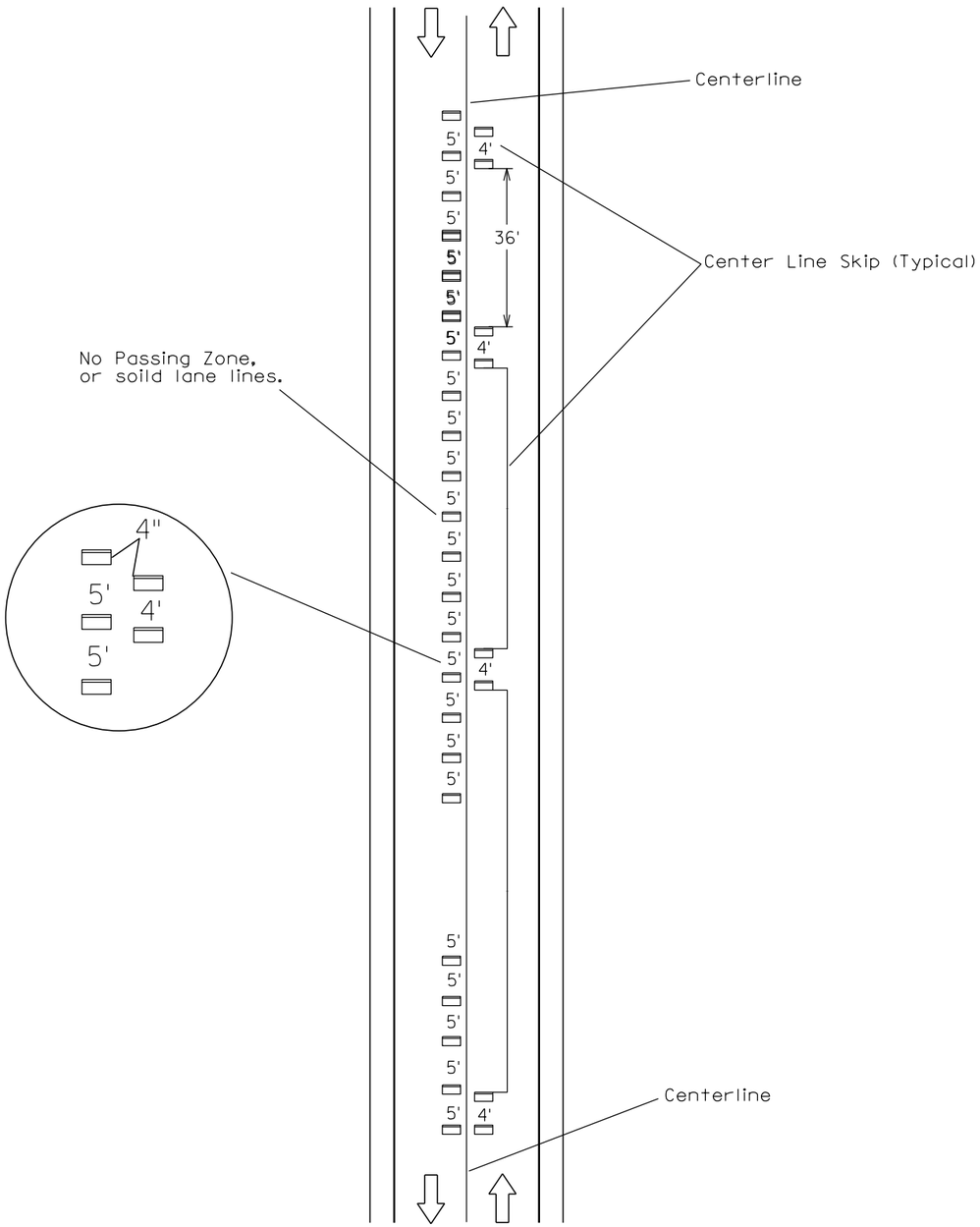
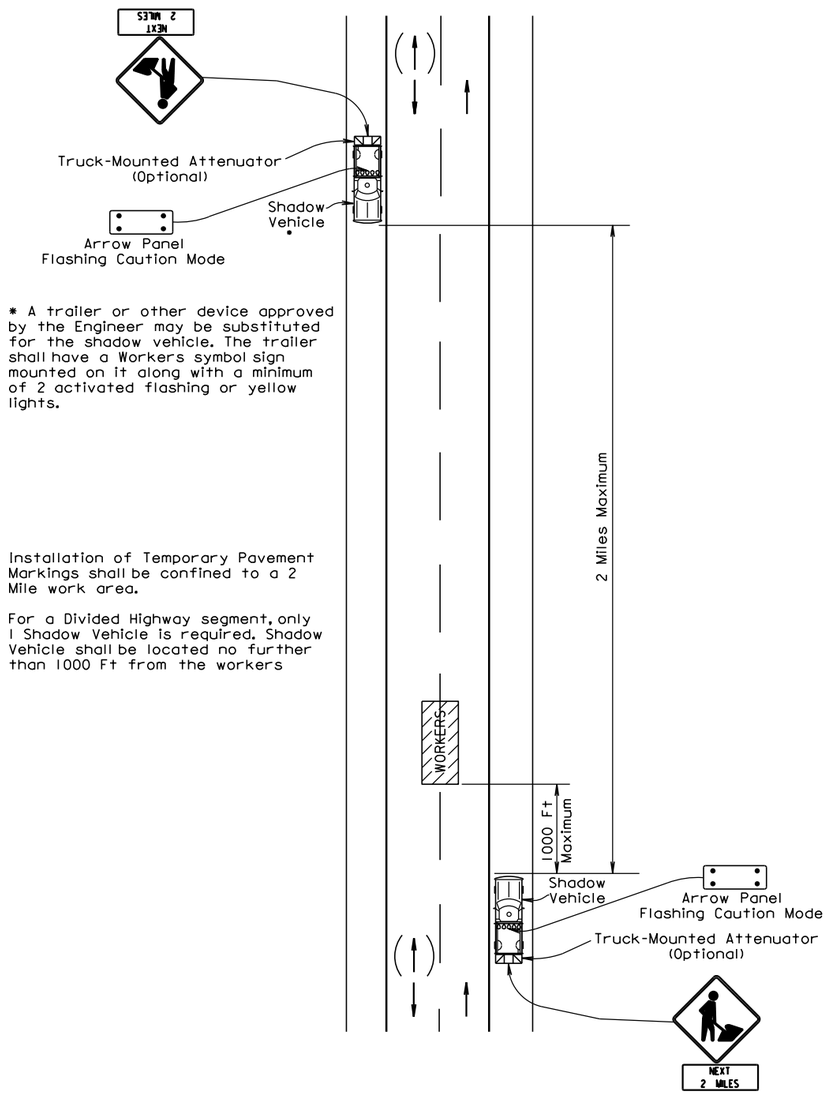
GUIDES FOR TRAFFIC CONTROL DEVICES TEMPORARY ROAD MARKER INSTALLATION



GUIDES FOR TRAFFIC CONTROL DEVICES APPLICATION OF TEMPORARY PAVEMENT MARKING TABS



* A trailer or other device approved by the Engineer may be substituted for the shadow vehicle. The trailer shall have a Workers symbol sign mounted on it along with a minimum of 2 activated flashing or yellow lights.

Installation of Temporary Pavement Markings shall be confined to a 2 Mile work area.

For a Divided Highway segment, only 1 Shadow Vehicle is required. Shadow Vehicle shall be located no further than 1000 Ft from the workers

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PCN 04J6 ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R4-7	KEEP RIGHT (symbol)	2	24" x 30"	5	10
W8-1	BUMP	4	48" x 48"	16	64
W8-3	PAVEMENT ENDS	2	48" x 48"	16	32
W8-6	TRUCK CROSSING	4	48" x 48"	16	64
W8-7	LOOSE GRAVEL	2	48" x 48"	16	32
W8-11	UNEVEN LANES	2	48" x 48"	16	32
W13-1P	ADVISORY SPEED (plaque)	4	30" x 30"	6	24
W20-1	ROAD WORK AHEAD	3	48" x 48"	16	48
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	16	32
W20-7	FLAGGER (symbol)	4	48" x 48"	16	64
W21-2	FRESH OIL	2	48" x 48"	16	32
W21-3	ROAD MACHINERY AHEAD	2	48" x 48"	16	32
G20-2	END ROAD WORK	3	36" x 18"	5	15
SPECIAL	WINDROW	2	48" x 48"	16	32
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			513

PCN 025V ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R1-1	STOP	4	30" x 30"	6	24
W1-3	REVERSE TURN (L or R)	2	48" x 48"	16	32
W3-1	STOP AHEAD (symbol)	4	48" x 48"	16	64
W8-1	BUMP	18	48" x 48"	16	288
W8-6	TRUCK CROSSING	4	48" x 48"	16	64
W8-7	LOOSE GRAVEL	14	48" x 48"	16	224
W8-11	UNEVEN LANES	2	48" x 48"	16	32
W8-17	SHOULDER DROP-OFF (symbol)	6	48" x 48"	16	96
W13-1P	ADVISORY SPEED (plaque)	18	30" x 30"	6	108
W20-1	ROAD WORK AHEAD	10	48" x 48"	16	160
W20-4	ONE LANE ROAD AHEAD	4	48" x 48"	16	64
W20-7	FLAGGER (symbol)	4	48" x 48"	16	64
W21-2	FRESH OIL	2	48" x 48"	16	32
W21-5	SHOULDER WORK	4	48" x 48"	16	64
G20-1	ROAD WORK NEXT __ MILES	4	36" x 18"	5	20
G20-2	END ROAD WORK	2	36" x 18"	5	10
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			1346

TYPE 3 BARRICADES

ITEM DESCRIPTION	QUANTITY
Type 3 Barricade, 8' Double Sided	4 Each

Detour Signing PCN 025V

Quantity	Sign Code	Width (In.)	Height (In.)	Sign Description	Color	Sq. Ft.	Total Sq. Ft.
2	SPECIAL	138	78	WR-1 - WIDTH RESTRICTION	BLACK/WHITE/ORANGE	74.8	149.5
2	SPECIAL	126	78	WR-2 - WIDTH RESTRICTION	BLACK/WHITE/ORANGE	68.3	136.5
2	SPECIAL	108	36	WR-A - NO VEHICLES OVER 12 FT WIDE	BLACK/WHITE	27.0	54.0
						TOTAL:	340.0

PLOT SCALE - 1:200
PLOT NAME - 1
FILE - ...\PRJ\CLRK04J6\04J6 BORDER.DGN
PLOTTED FROM - TRAB12222

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.

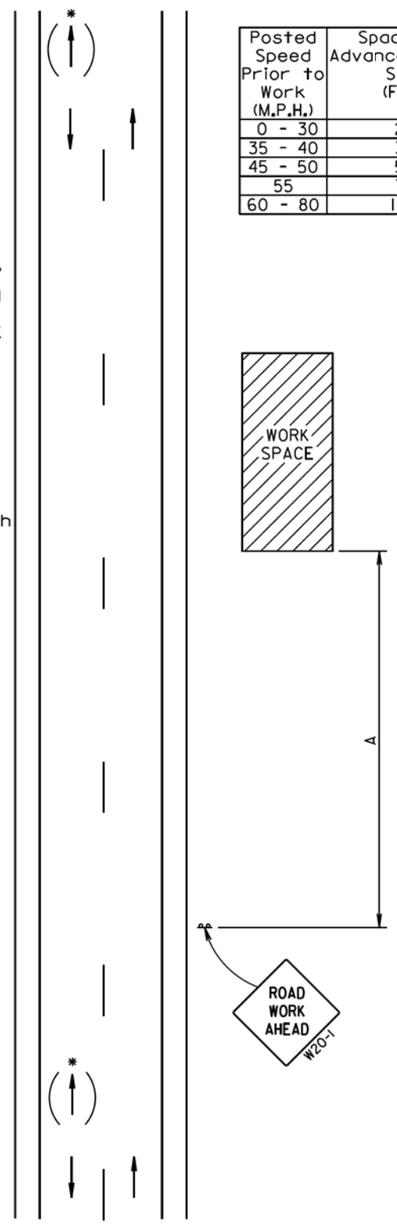
The signs illustrated shall be used where there are distracting situations; such as: vehicles parked on shoulder, vehicles accessing the work site via the highway, and equipment traveling on or crossing the roadway to perform work operations.

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.

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)
0 - 30	200
35 - 40	350
45 - 50	500
55	750
60 - 80	1000



April 15, 2015

Published Date: 4th Qtr. 2015

SDDOT

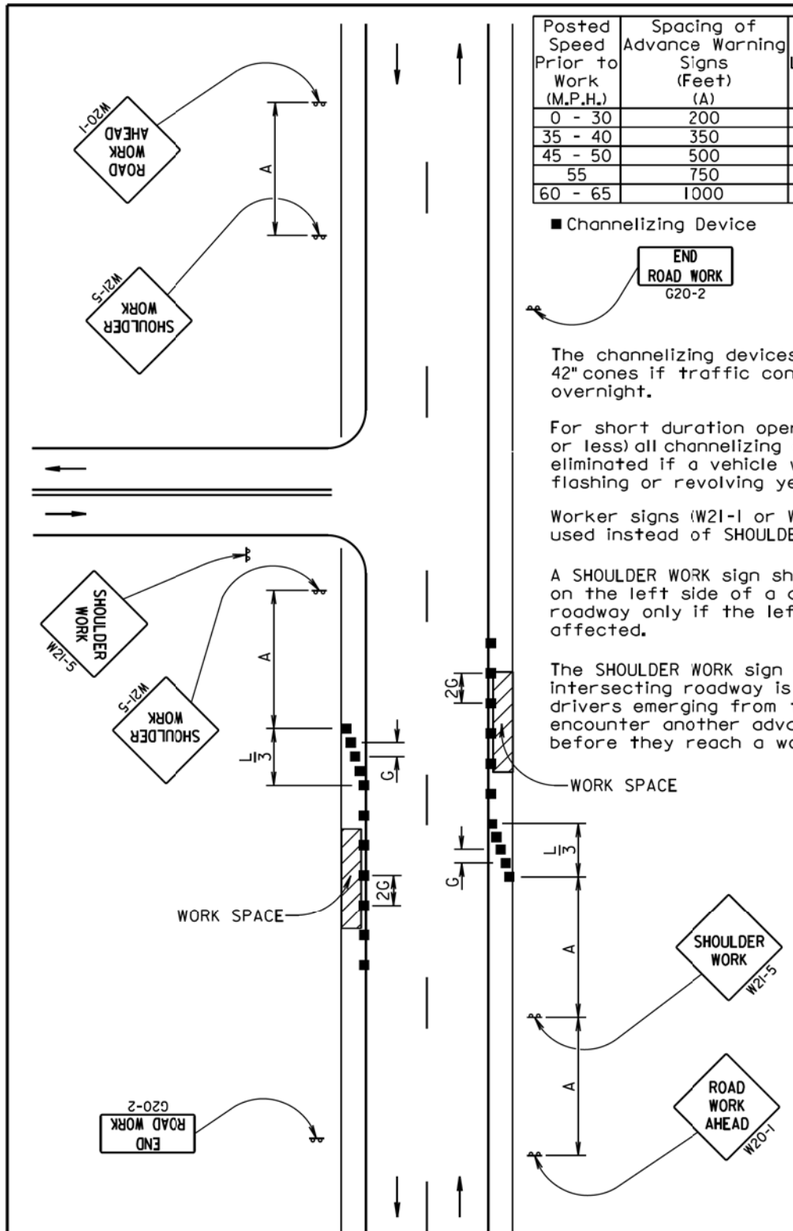
GUIDES FOR TRAFFIC CONTROL DEVICES
WORK BEYOND THE SHOULDER

PLATE NUMBER 634.01

Sheet 1 Of 1

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

■ Channelizing Device



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

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

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

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

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

September 22, 2014

Published Date: 4th Qtr. 2015

SDDOT

GUIDES FOR TRAFFIC CONTROL DEVICES
WORK ON SHOULDERS

PLATE NUMBER 634.03

Sheet 1 of 1

PLOT SCALE - 1:200
PLOTTED FROM - TRAB12222
PLOT NAME - 1
FILE - ...\04J6_634.01_634.03.DGN

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

Flagger

Channelizing Device

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

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

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

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

The channelizing devices shall be drums or 42" cones.

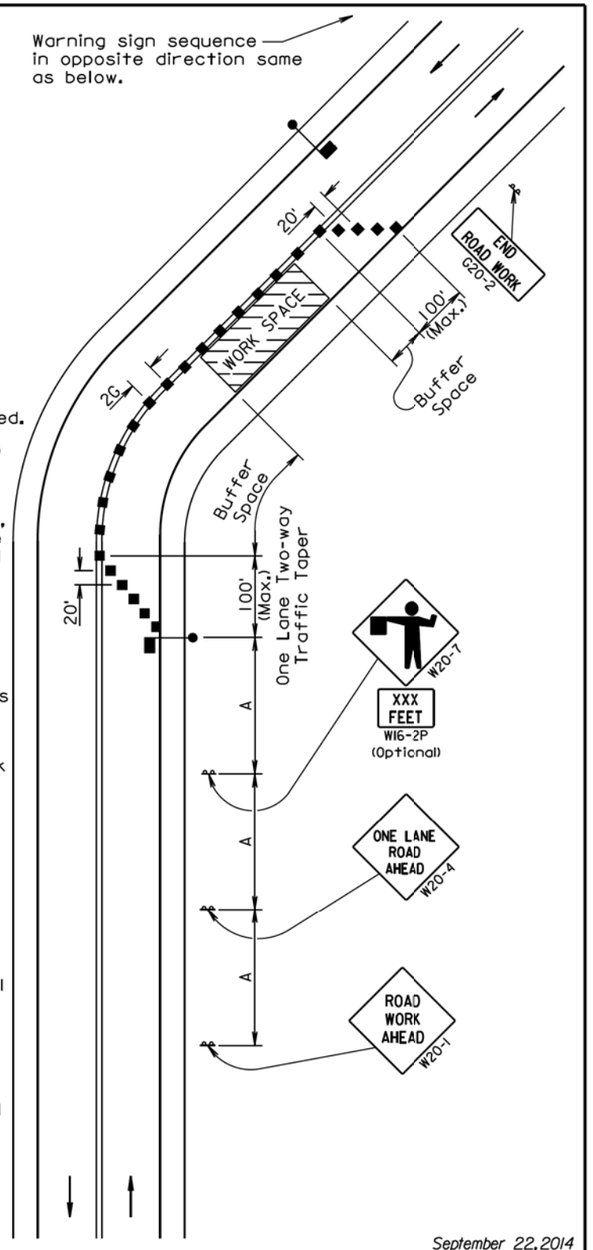
Channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.

END ROAD WORK G20-2

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

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

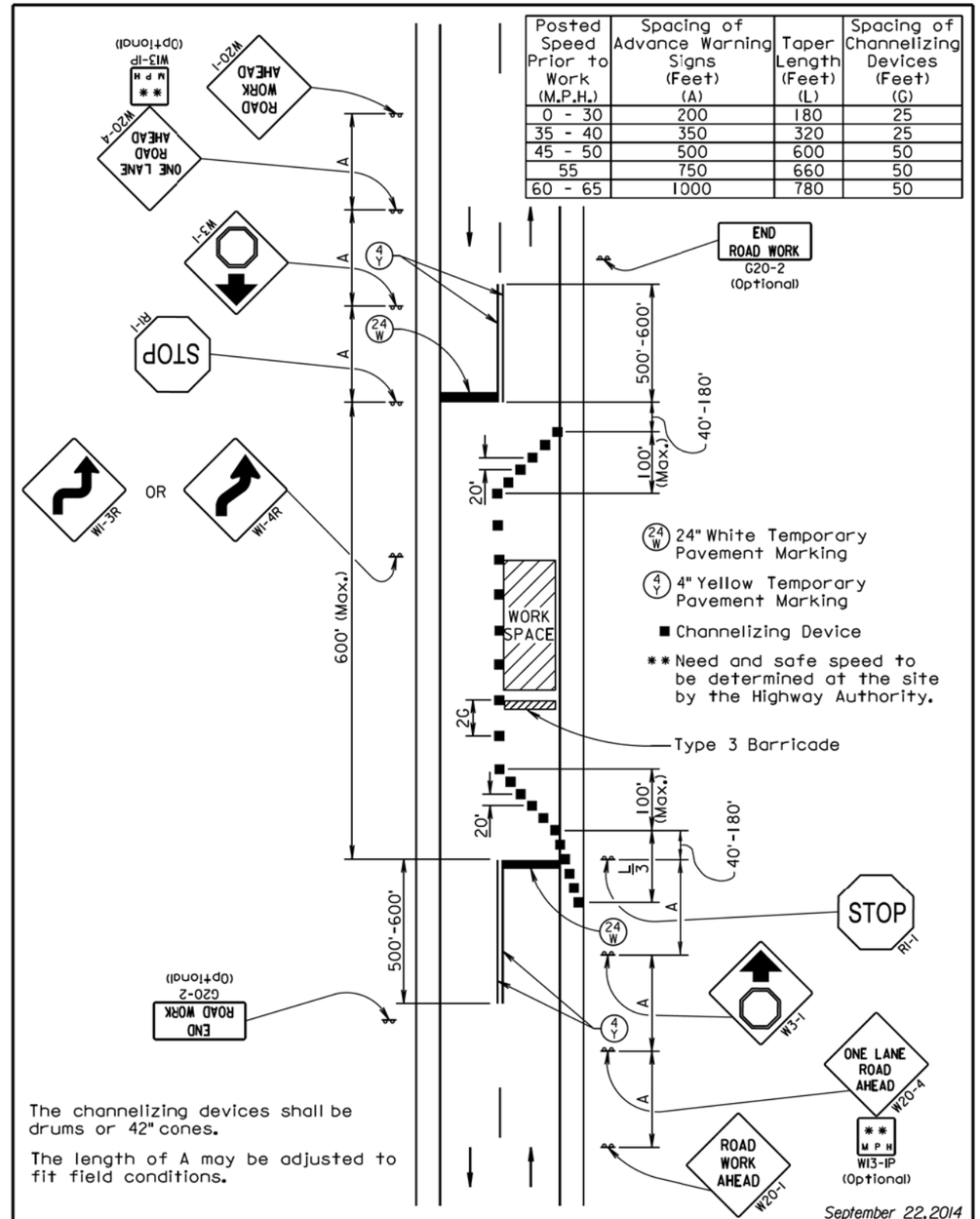
The length of A may be adjusted to fit field conditions.



September 22, 2014

Published Date: 4th Qtr. 2015	SDDOT	GUIDES FOR TRAFFIC CONTROL DEVICES LANE CLOSURE WITH FLAGGER PROVIDED	PLATE NUMBER 634.23
			Sheet 1 of 1

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

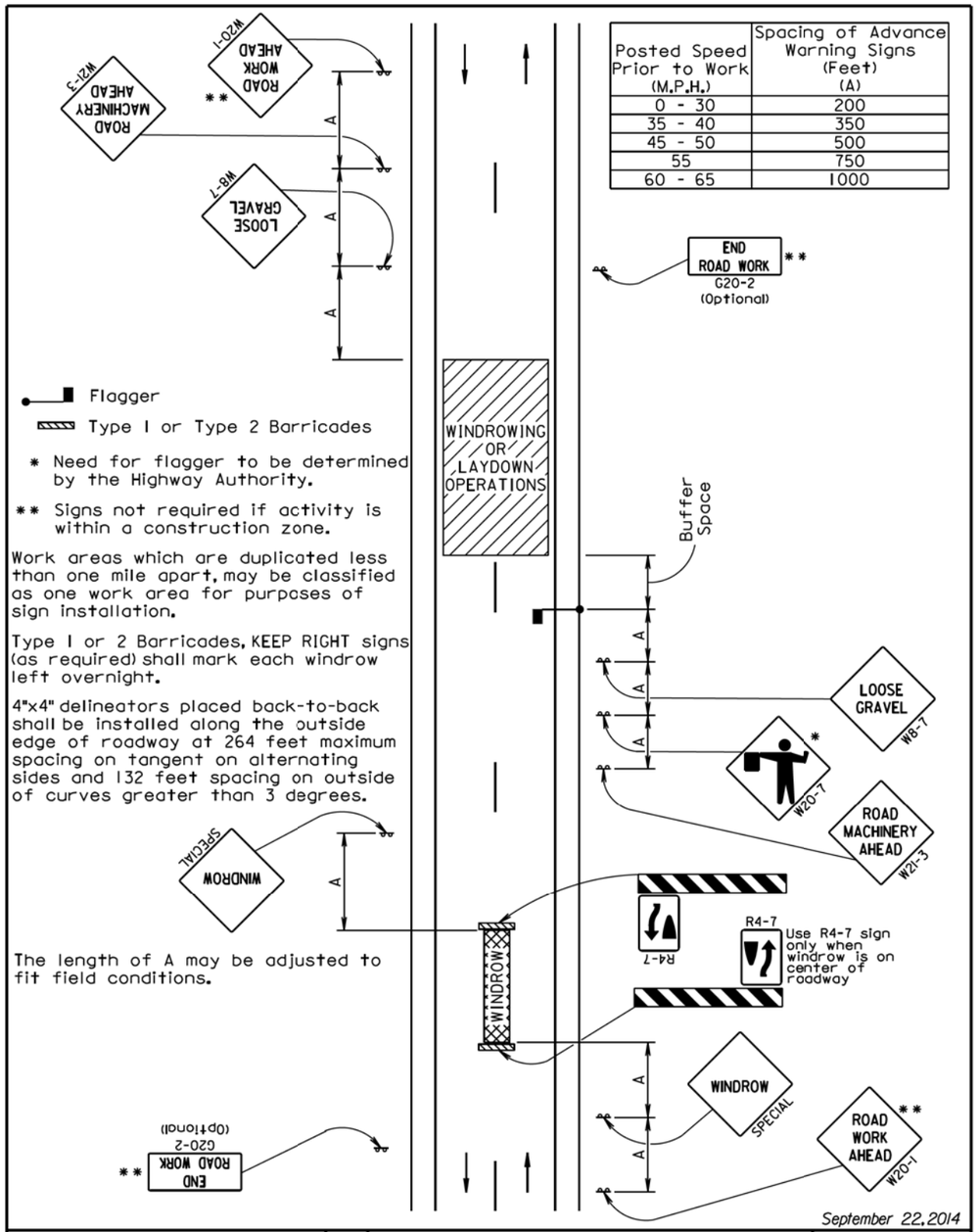


The channelizing devices shall be drums or 42" cones.

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

September 22, 2014

Published Date: 4th Qtr. 2015	SDDOT	GUIDES FOR TRAFFIC CONTROL DEVICES LANE CLOSURE USING STOP SIGNS	PLATE NUMBER 634.25
			Sheet 1 of 1



* Need for flagger to be determined by the Highway Authority.

** Signs not required if activity is within a construction zone.

Work areas which are duplicated less than one mile apart, may be classified as one work area for purposes of sign installation.

Type I or 2 Barricades, KEEP RIGHT signs (as required) shall mark each windrow left overnight.

4"x4" delineators placed back-to-back shall be installed along the outside edge of roadway at 264 feet maximum spacing on tangent on alternating sides and 132 feet spacing on outside of curves greater than 3 degrees.

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

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

September 22, 2014

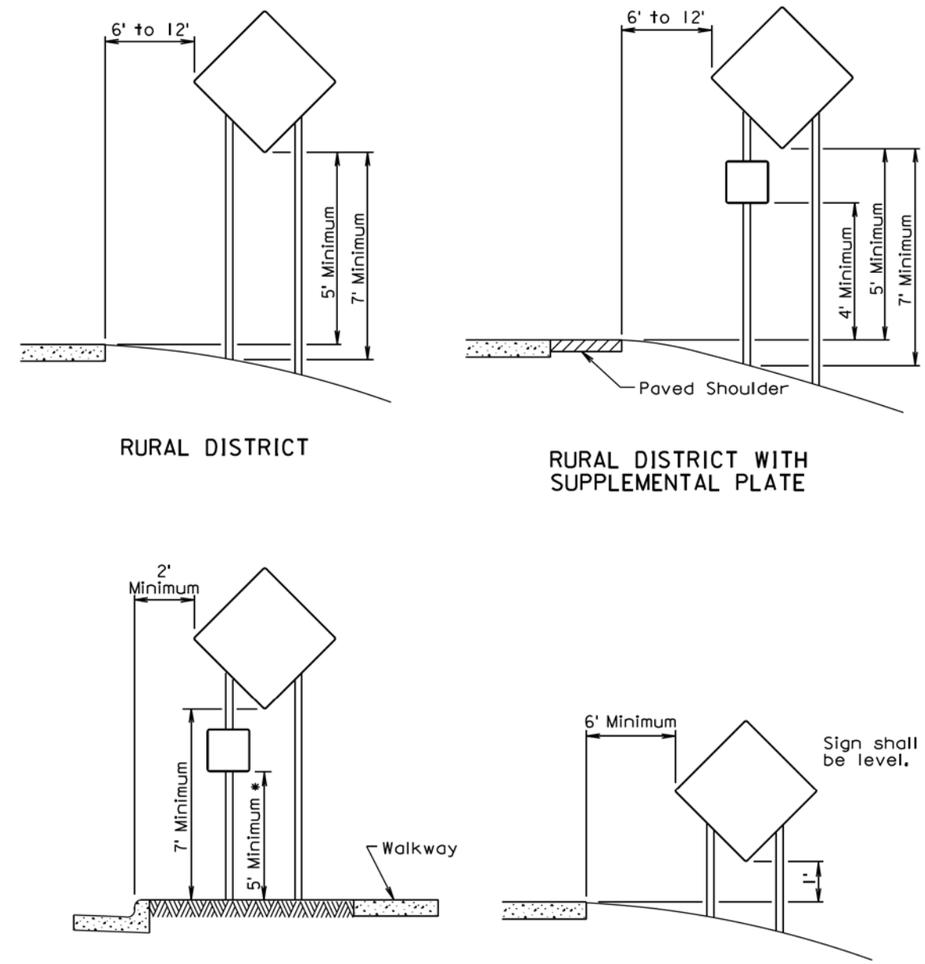
Published Date: 4th Qtr. 2015

SDDOT

GUIDES FOR TRAFFIC CONTROL DEVICES
WINDROWING OR LAYDOWN OPERATION

PLATE NUMBER 634.27

Sheet 1 of 1



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

(Not applicable to regulatory signs)

September 22, 2014

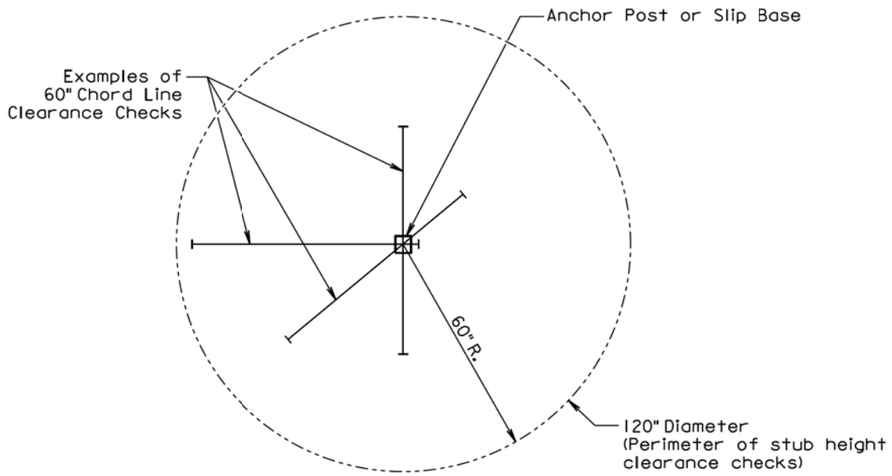
Published Date: 4th Qtr. 2015

SDDOT

CRASHWORTHY SIGN SUPPORTS
(Typical Construction Signing)

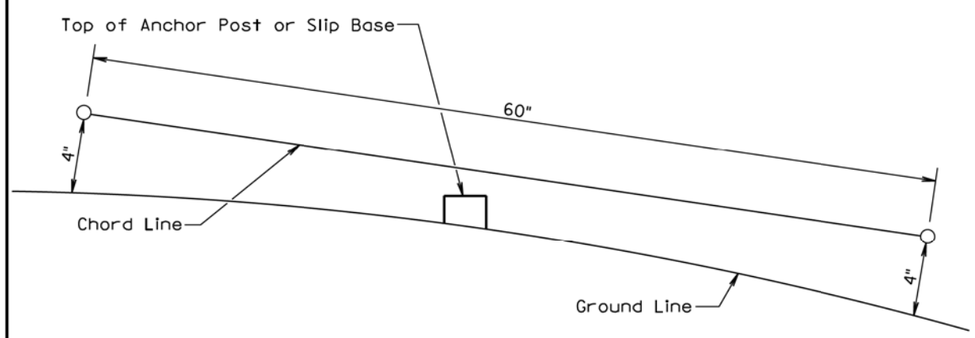
PLATE NUMBER 634.85

Sheet 1 of 1



PLAN VIEW

(Examples of stub height clearance checks)



ELEVATION VIEW

GENERAL NOTES:

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

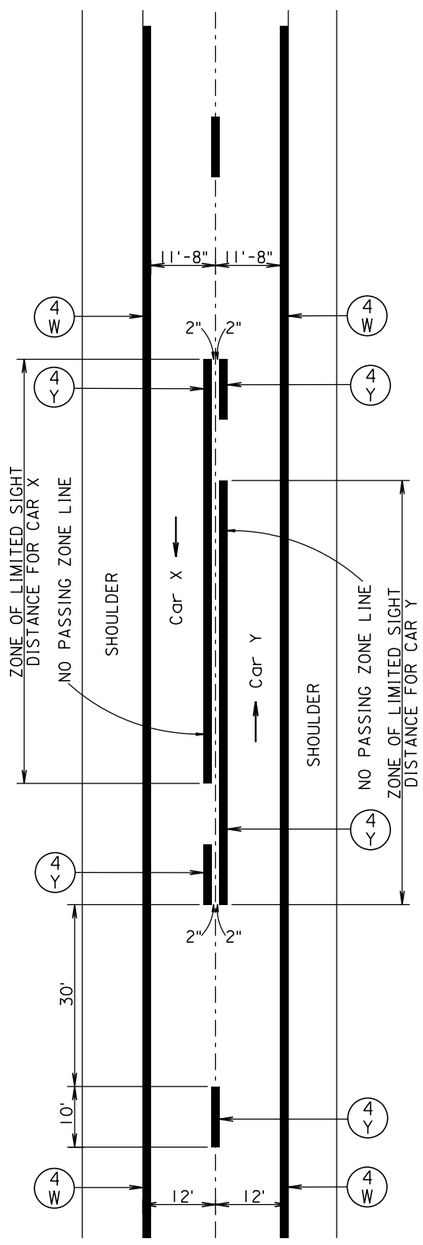
At locations where there is curb and gutter adjacent to the breakaway sign support, the stub height shall be a maximum of 4" above the ground line at the localized area adjacent to the breakaway support stub.

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

July 1, 2005

Published Date: 4th Qtr. 2015	SDDOT	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99 Sheet 1 of 1

TWO LANE UNDIVIDED ROADWAY



KEY	ITEM
4 W	4" White
4 Y	4" Yellow

FURNISHING AND APPLYING PAVEMENT MARKING PAINT

1. The approximate paint application rates shall be as follows:

   Undivided Roadway

   4" Yellow Centerline
   16.9 Gallons/Pass-Mile
   (Solid Line)

   4" Yellow Centerling
   4.6 Gallons/Pass-Mile
   (Dashed Line)

   4" White Edgeline
   16.9 Gallons/Pass-Mile
   (Solid Line)

2. The typical pavement markings as shown on the following sheet shall be applied throughout the entire length of the project.

3. Exact location of the NO PASSING ZONE lines will be determined in the field by the Engineer. A dash of white paint will mark the beginning and end of all no passing zones. NO PASSING ZONE signs and the ending post in fence lines, if present, shall not be used as the beginning and ending NO PASSING ZONE lines.

4. Traffic Control shall be incidental to the cost of application. The striper and advance or trailing warning vehicle shall be equipped with flashing amber lights or advance warning arrow panel.

PLOT SCALE - 1:200
PLOTTED FROM - TRAB12222
PLOT NAME - 4
FILE - ...\025V PAVEMENT MARKING DETAILS.DGN

CONTROL DATA

HORIZONTAL AND VERTICAL CONTROL POINTS

HWY	POINT	STATION	OFFSET	DESCRIPTION	NORTHING	EASTING	ELEVATION
SD 25	BM 1	209+79	120.0'-L	Rebar and Cap	469365.9890	2605108.7450	1810.14
SD 25	BM 2	237+09	74.0'-R	Rebar and Cap	466630.8790	2605017.5680	1840.89
SD 20	BM 3	798+85.47	38.33'-R		468157.7510	2568074.7590	1789.39
SD 20	BM 4	806+15.37	72.64'-L		468287.2870	2568801.5920	1786.03
SD 20	BM 5	827+91.83	66.44'-L		468352.1890	2570967.5540	1788.74
SD 20	BM 6	833+84.67	57.60'-L		468374.6780	2571560.0350	1787.90
SD 20	BM 7	851+22.99	91.10'-L		468499.8370	2573298.5000	1779.46
SD 20	BM 8	851+66.39	91.58'-L		468502.5310	2573342.2470	1779.42
SD 20	BM 9	851+21.04	54.05'-R		468354.7810	2573304.1960	1779.44
SD 20	BM 10	851+65.76	118.07'-R		468293.0890	2573351.6940	1779.44
SD 20	BM 11	888+00.47	24.85'-L		468469.5610	2576967.3290	1800.96
SD 20	BM 12	897+49.17	29.20'-L		468521.7310	2577914.4620	1776.16
SD 20	BM 13	897+58.23	25.88'-R		468467.2130	2577926.4800	1776.08
SD 20	BM 14	1038+45.77	11.75'-L		468913.2990	2592006.3530	1820.40
SD 20	BM 15	1044+10.52	12.52'-L		468929.9660	2592570.7540	1820.02
SD 20	BM 16	1113+54.32	13.10'-L		469143.4310	2599499.5380	1820.74
SD 20	BM 17	1118+80.14	13.10'-L		469158.7860	2600025.1320	1820.89

HORIZONTAL ALIGNMENT DATA

MAINLINE SD 25

Type	Station			Northing	Easting
POB	201+59.04			470182.040	2604963.853
		TL= 905.36	S 1°44'55" E		
PI	210+64.40		Delta = 0°12'29" L	469277.099	2604991.482
		TL= 1942.28	S 1°57'24" E		
PC	230+06.68			467335.951	2605057.801
PI	231+01.65	R = 11460.0	Delta = 0°56'59" L	467241.034	2605061.044
PT	231+96.62			467146.184	2605065.860
		TL= 511.99	S 2°54'23" E		
PI	237+08.62		Delta = 0°04'48" L	466634.849	2605091.820
		TL= 378.39	S 2°59'11" E		
PI	240+87.01		Delta = 1°58'01" R	466256.975	2605111.546
		TL= 1913.74	S 2°54'21" E		
POE	260+00.75			464345.696	2605208.559

The coordinates shown on this sheet are based on the South Dakota State Plane Coordinate System. North Zone (NAD 83/07); Geoid 09; SF = 099988782
The elevations shown on this sheet are based on NAVD 88.

PLOT SCALE - 1:200
PLOTTED FROM - TRAB12222
PLOT NAME - 1
FILE -...\PRJ\CLRK04J6\04J6 BORDER.DGN

EXISTING TOPOGRAPHY SYMBOLOGY AND LEGEND

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	PH 0025(77)164	46	109

Plotting Date: 06/10/2015

Anchor
Antenna
Approach
Assumed Corner
Azimuth Marker
BBQ Grill/ Fireplace
Bearing Tree
Bench Mark
Box Culvert
Bridge
Brush
Buildings
Bulk Tank
Cattle Guard
Cemetery
Centerline
Cistern
Clothes Line
Commercial Sign Double Face
Commercial Sign One Post
Commercial Sign Overhead
Commercial Sign Two Post
Concrete Symbol
Creek Edge
Curb/Gutter
Curb
Dam Grade/Dike/Levee
Deck Edge
Ditch Block
Doorway Threshold
Drainage Profile
Drop Inlet
Edge Of Asphalt
Edge Of Concrete
Edge Of Gravel
Edge Of Other
Edge Of Shoulder
Elec. Trans./Power Jct. Box
Fence Barbwire
Fence Chainlink
Fence Electric
Fence Misc.
Fence Rock
Fence Snow
Fence Wood
Fence Woven
Fire Hydrant
Flag Pole
Flower Bed
Gas Valve Or Meter
Gas Pump Island
Grain Bin
Guardrail
Guide Sign One Post
Guide Sign Two Post
Gutter
Guy Pole
Haystack

Hedge
Highway R.O.W. Marker
Interstate Close Gate
Iron Pin
Irrigation Ditch
Lake Edge
Lawn Sprinkler
Mailbox
Manhole Electric
Manhole Gas
Manhole Misc
Manhole Sanitary Sewer
Manhole Storm Sewer
Manhole Telephone
Manhole Water
Merry-Go-Round
Microwave Radio Tower
Misc. Line
Misc. Property Corner
Misc. Post
Overhang Or Encroachment
Overhead Utility Line — OH —
Parking Meter
Pipe With End Section
Pipe With Headwall
Pipe Without End Section
Playground Slide
Playground Swing
Power And Light Pole
Power And Telephone Pole
Power Meter
Power Pole
Power Pole And Transformer
Power Tower Structure
Propane Tank
Property Pipe
Property Pipe With Cap
Property Stone
Public Telephone
Railroad Crossing Signal
Railroad Milepost Marker
Railroad Profile
Railroad R.O.W. Marker
Railroad Signs
Railroad Switch
Railroad Track
Railroad Trestle
Rebar
Rebar With Cap
Reference Mark
Regulatory Sign One Post
Regulatory Sign Two Post
Retaining Wall
Riprap
River Edge
Rock And Wire Baskets
Rockpiles
Satellite Dish
Septic Tank

Shrub Tree
Sidewalk
Sign Face
Sign Post
Slough Or Marsh
Spring
Stream Gauge
Street Marker
Subsurface Utility Exploration Test Hole
Telephone Fiber Optics — T/F —
Telephone Junction Box
Telephone Pole
Television Cable Jct Box
Television Tower
Test Wells/Bore Holes
Traffic Signal
Trash Barrel
Tree Belt
Tree Coniferous
Tree Deciduous
Tree Stumps
Triangulation Station
Underground Electric Line — P —
Underground Gas Line — G —
Underground High Pressure Gas Line — HG —
Underground Sanitary Sewer — S —
Underground Storm Sewer — S —
Underground Tank
Underground Telephone Line — T —
Underground Television Cable — TV —
Underground Water Line — W —
Warning Sign One Post
Warning Sign Two Post
Water Fountain
Water Hydrant
Water Meter
Water Tower
Water Valve
Water Well
Weir Rock
Windmill
Wingwall
Witness Corner

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

Plot Scale - 1:200
Plotted From - trab12222
File - ...\prj\Clrk04J6\04J6toposymb.dgn

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	PH 0025(77)164	47	109

211+40
Take Out 18"-85' RCP
and 2 Flared Ends
(Incidental Work, Grading)

211+40 (9 ac)
Install 30" -84' RCP
and 2 Sloped Ends

211+40-R
Install Bank and Channel
Protection Gabions
(6.0 CY)

213+18-45' L
Take Out 18"-58' RCP
and 2 Sloped Ends
(Incidental Work, Grading)

213+18- 45' L (2 ac)
Install 18" -60' CMP
and 2 Safety Ends

213+18-R
Refurbish Single Mailbox

221+55
Take Out 18"-112' RCP
and 2 Flared Ends
(Incidental Work, Grading)

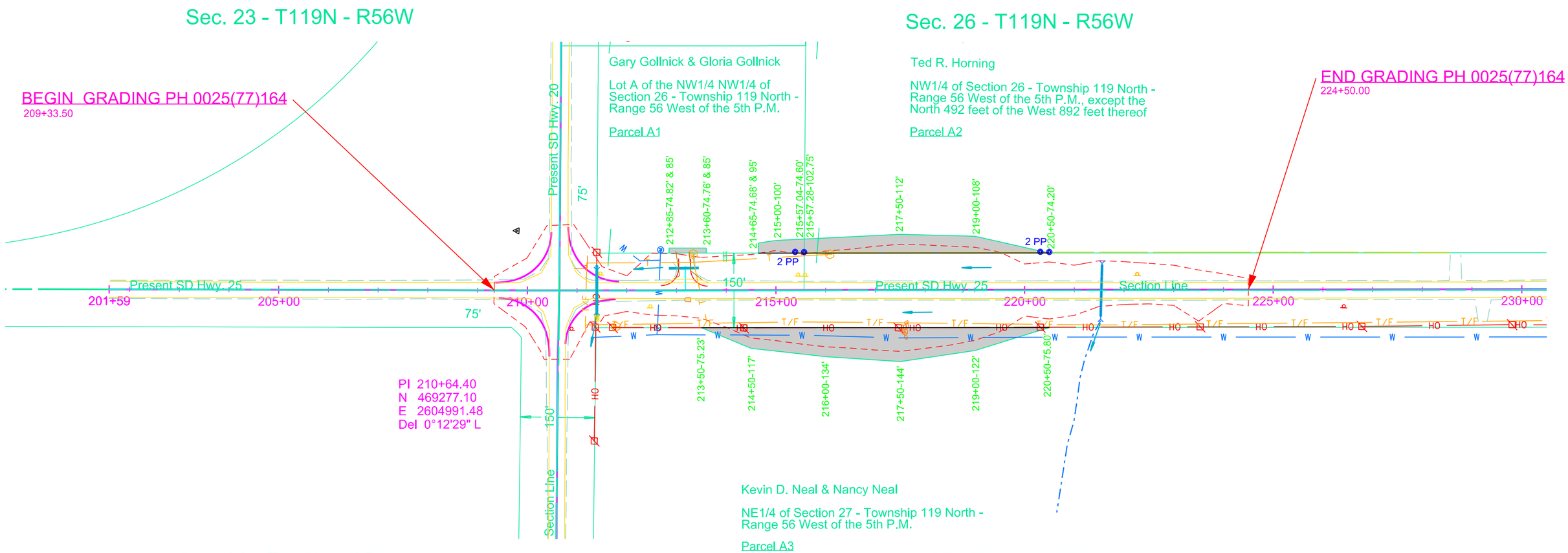
221+55 (1 ac)
Install 24" -106' RCP
and 2 Sloped Ends

215+38-77' L to 220+50-76' L
Remove Existing Fence

211+40-76' R to 217+55-77' R
Remove Existing Fence

215+38-77' L
Begin type 2

220+50-76' L
End type 2



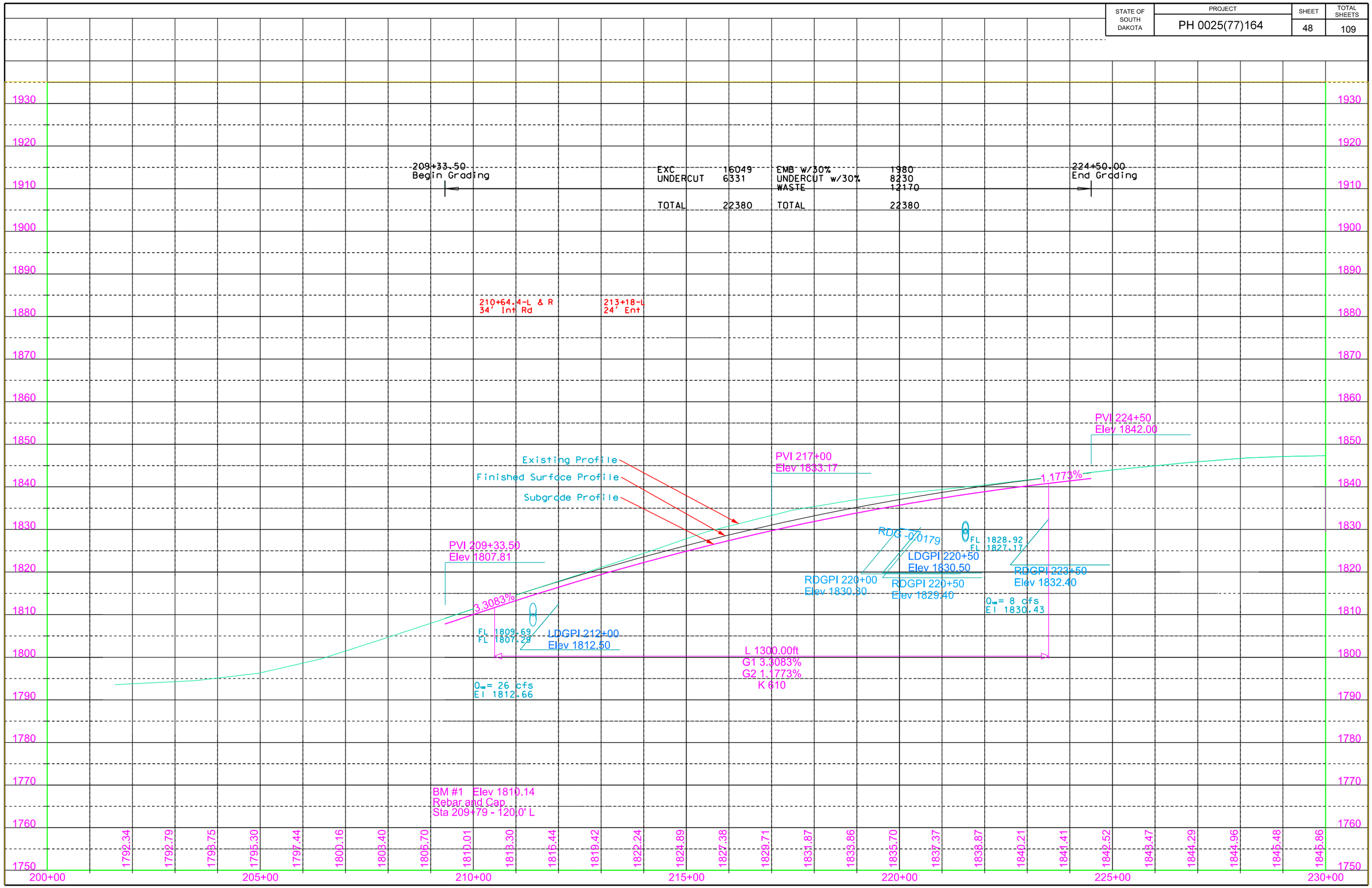
Parcel A1
212+85 to 213+60 L
Temporary Easement for
Approach containing 0.02 Ac
(766 sq ft), more or less

Parcel A1
214+65 to 215+57.28 L
Temporary Easement for
Cut containing 0.05 Ac
(2328 sq ft), more or less

Parcel A2
215+57.04 to 220+50 L
Temporary Easement for
Cut containing 0.33 Ac
(14202 sq ft), more or less

Parcel A3
213+50 to 220+50 R
Temporary Easement for
Cut containing 0.71 Ac
(31212 sq ft), more or less

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	PH 0025(77)164	48	109

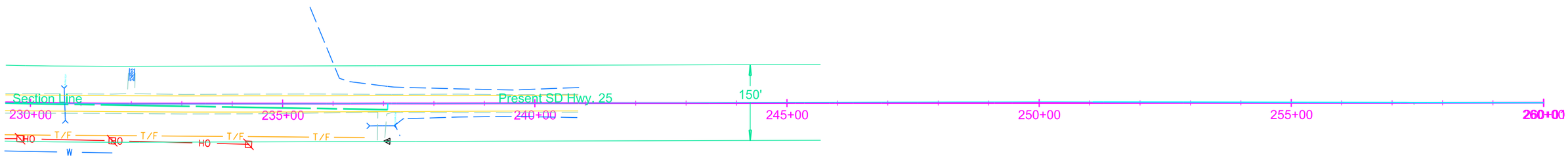


Sec. 26 - T119N - R56W

PI 231+01.65
N 467241.03
E 2605061.04
Del 0°56'59" L
Dc 0°30'00"
T 94.97
L 189.94
R 11460.00

PI 237+08.62
N 466634.85
E 2605091.82
Del 0°04'48" L

PI 240+87.01
N 466256.97
E 2605111.55
Del 1°58'01"R



Sec. 27 - T119N - R56W

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	PH 0025(77)164	50	109

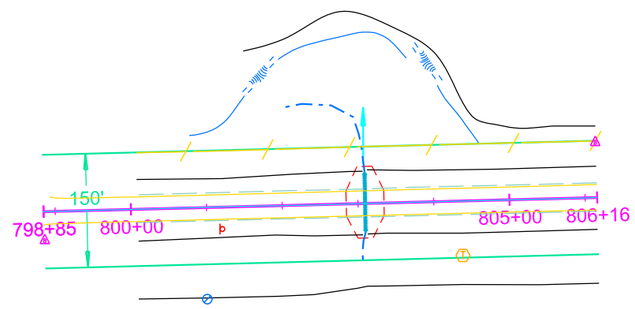
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0020(124)363	51	109

Plotting Date: 12/29/2015

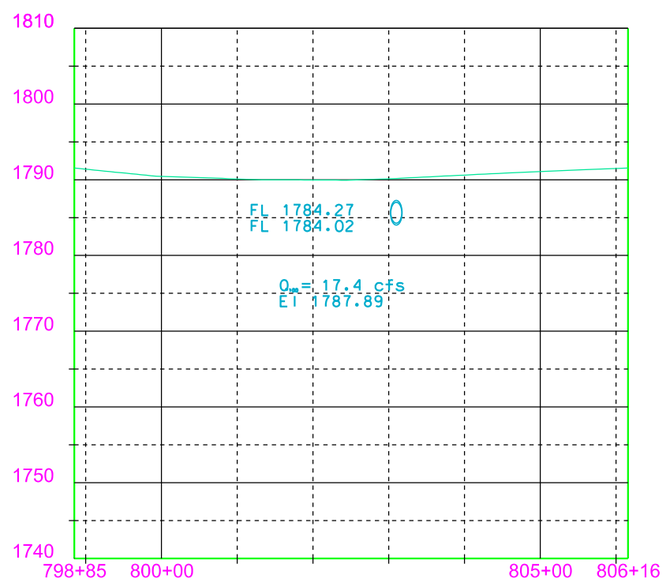
803+10
Take Out 18"-80' CMP
(Incidental Work, Grading)

803+10
Install 24"-66' RCP
and 2 Sloped Ends

Sec 22-T119N-R57W



Sec 27-T119N-R57W



BM #3 Elev 1789.39
Sta 798+85.47 - 38.33' R

BM #4 Elev 1786.03
Sta 806+15.37- 72.64' L

PLOT SCALE - 1:200

PLOTTED FROM - TRAB12222

PLOT NAME - 1

FILE - ...\025VCROSSSECTIONS.DGN

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0020(124)363	52	109

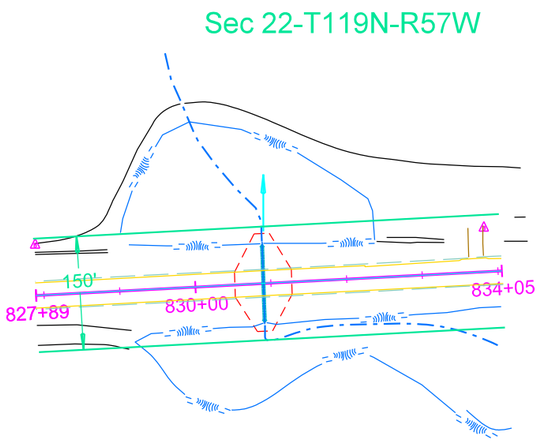
Plotting Date: 12/29/2015

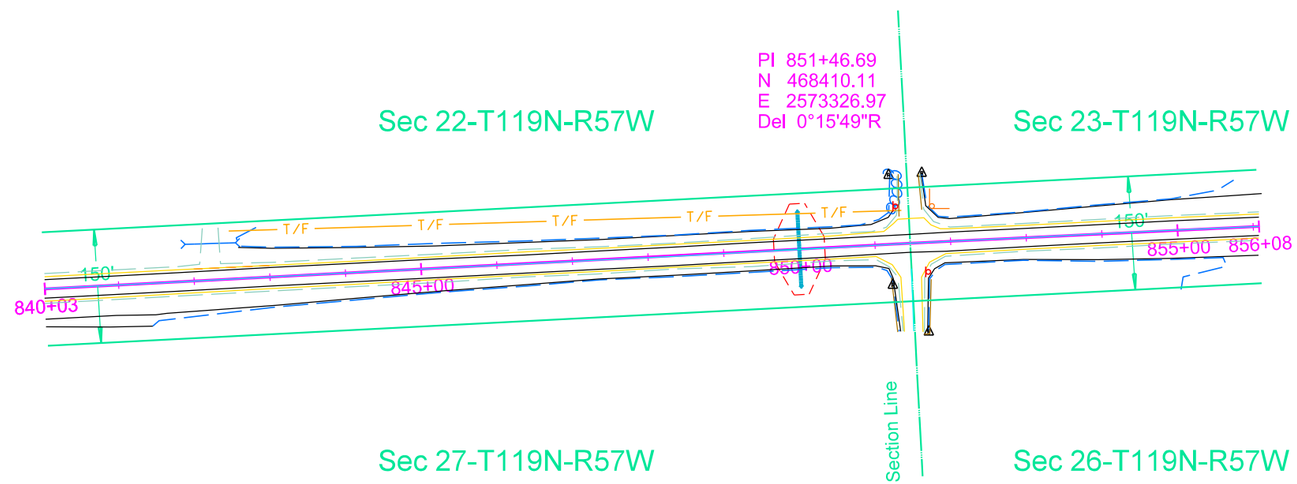
830+90
Take Out 30"-108' CMP
(Incidental Work, Grading)

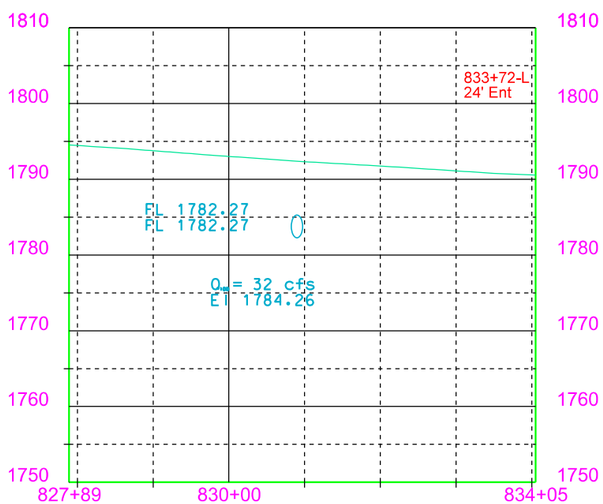
830+90
Install 30"-92' RCP
and 2 Sloped Ends

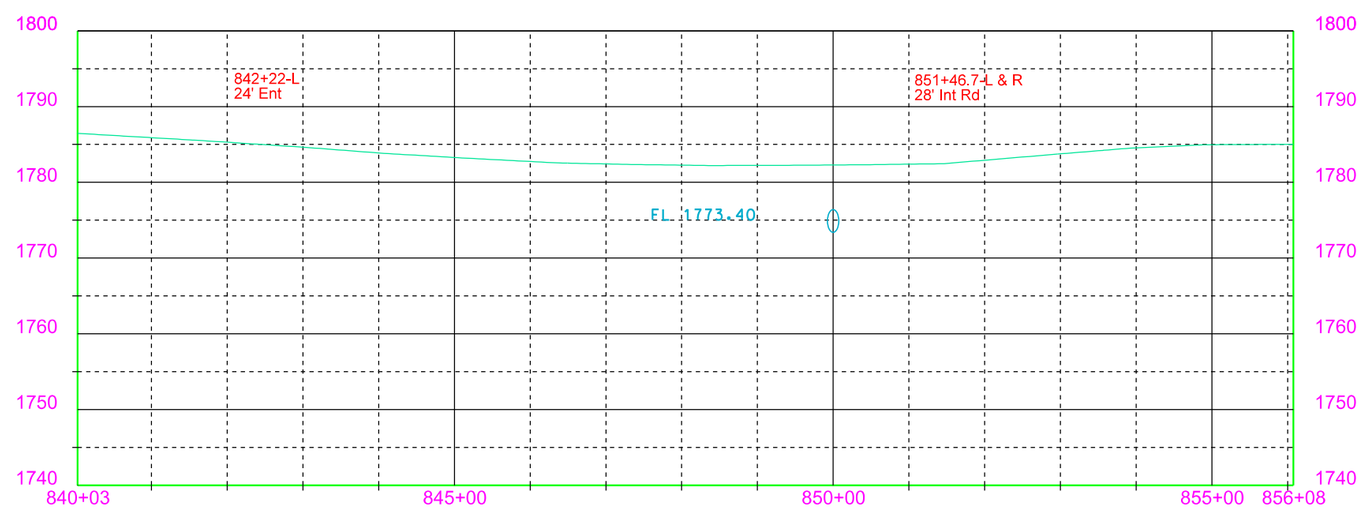
850+00
Take Out 24"-86' CMP
(Incidental Work, Grading)

850+00
Install 24"-86' RCP
and 2 Flared Ends









BM #5 Elev 1788.74
Sta 827+91.83 - 66.44' L

BM #6 Elev 1787.90
Sta 833+84.67 - 57.60' L

BM #7 Elev 1779.46
Sta 851+22.99 - 91.10' L

BM #8 Elev 1779.42
Sta 851+66.39 - 91.58' L

BM #9 Elev 1779.44
Sta 851+21.04 - 54.05' R

BM #10 Elev 1779.44
Sta 851+65.76 - 118.07' R

PLOT SCALE - 1:200
PLOTTED FROM - TRAB12222
PLOT NAME - 2
FILE - ...\025VCROSSSECTIONS.DGN

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0020(124)363	53	109

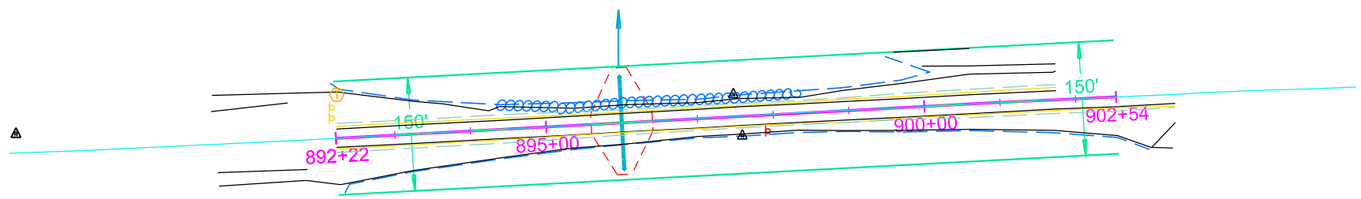
Plotting Date: 12/29/2015

896+00
Take Out 24"-118' CMP
(Incidental Work, Grading)

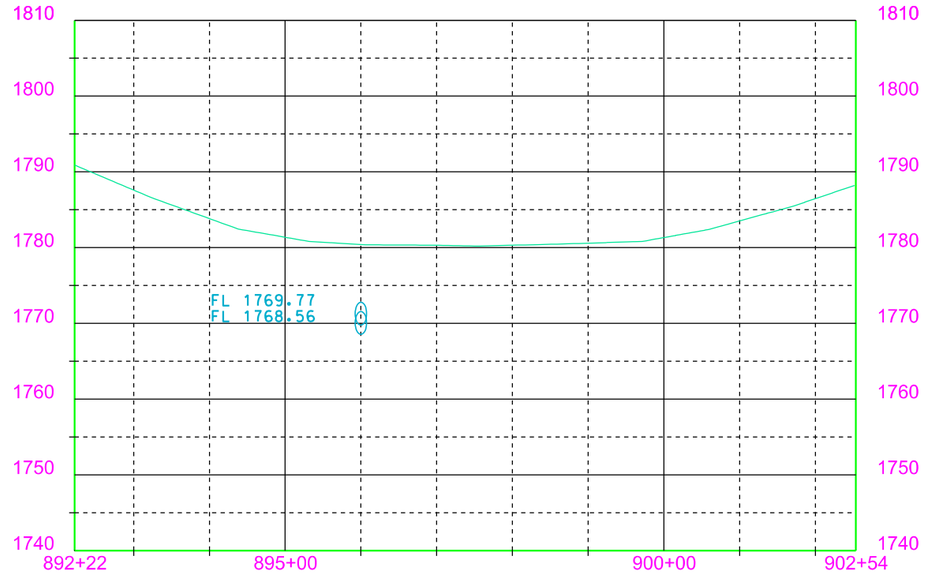
896+00
Install 24"-110' RCP
and 2 Flared Ends

Sec 23-T119N-R57W

PI 900+84.84
N 468510.65
E 2578251.22
Del 0°20'47"R



Sec 26-T119N-R57W



BM #11 Elev 1800.96
Sta 888+00.47 - 24.85' L

BM #12 Elev 1776.16
Sta 897+49.17 - 29.20' L

BM #13 Elev 1776.08
Sta 897+58.23 - 25.88' R

PLOT SCALE - 1:200

PLOTTED FROM - TRAB12222

PLOT NAME - 3

FILE - ...\025VCROSSSECTIONSS.DGN

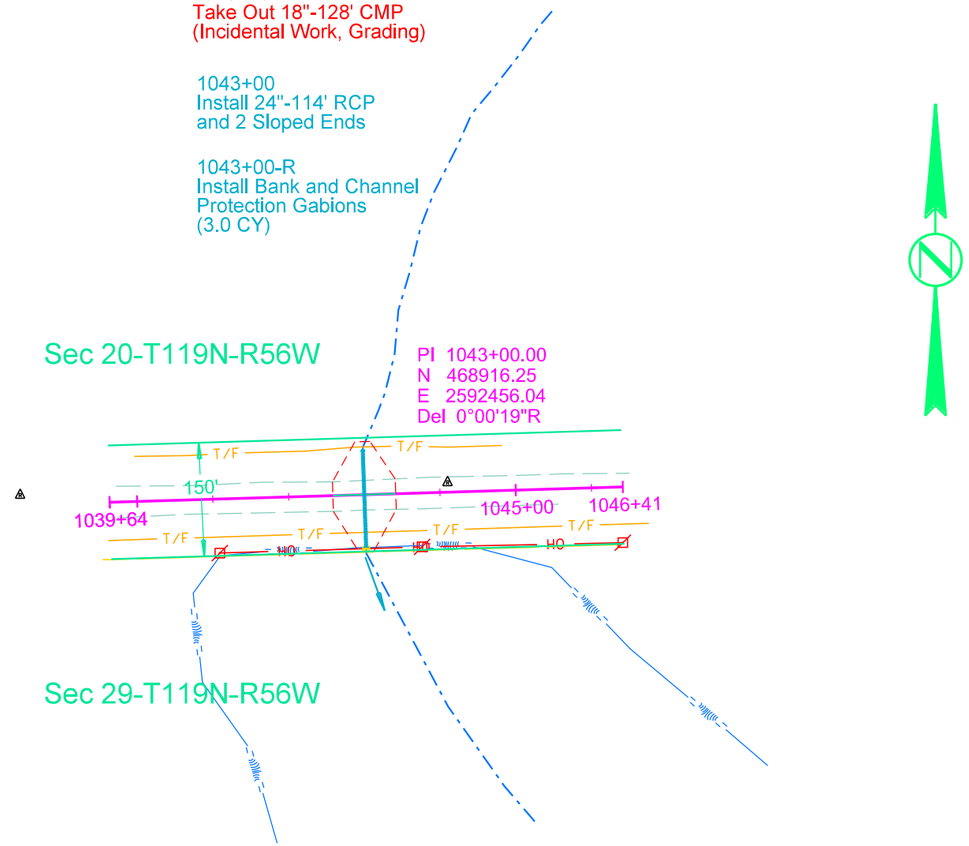
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0020(124)363	54	109

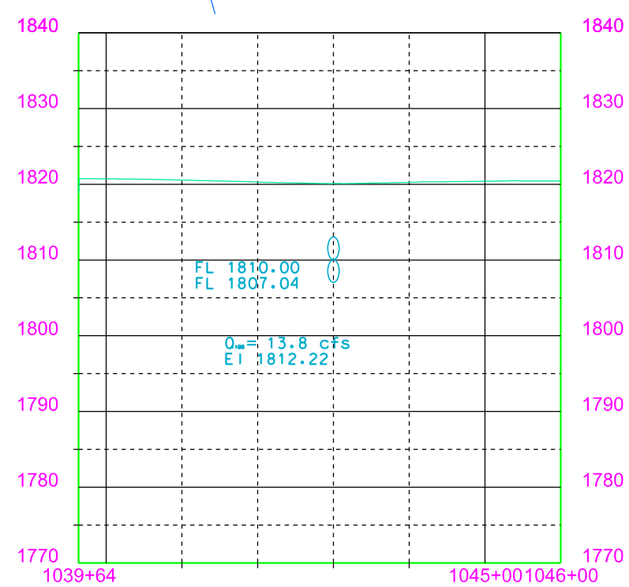
Plotting Date: 12/29/2015

1043+00
Take Out 18"-128' CMP
(Incidental Work, Grading)

1043+00
Install 24"-114' RCP
and 2 Sloped Ends

1043+00-R
Install Bank and Channel
Protection Gabions
(3.0 CY)





BM #14 Elev 1820.40
Sta 1038+45.77 - 11.75' L

BM #15 Elev 1820.02
Sta 1044+10.52 - 12.52' L

PLOT SCALE - 1:200

PLOTTED FROM - TRAB12222

PLOT NAME - 4

FILE - ...\CLRK04J6\FLOW\025VCULVERTS.DGN

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0020(124)363	55	109

Plotting Date: 12/29/2015

1115+00
Take Out 18"-100' CMP
(Incidental Work, Grading)

1116+20
Take Out 18"-100' CMP
(Incidental Work, Grading)

1115+00
Install 36"-70' RCP
and 2 Flared Ends

1116+20
Install 24"-86' RCP
and 2 Sloped Ends

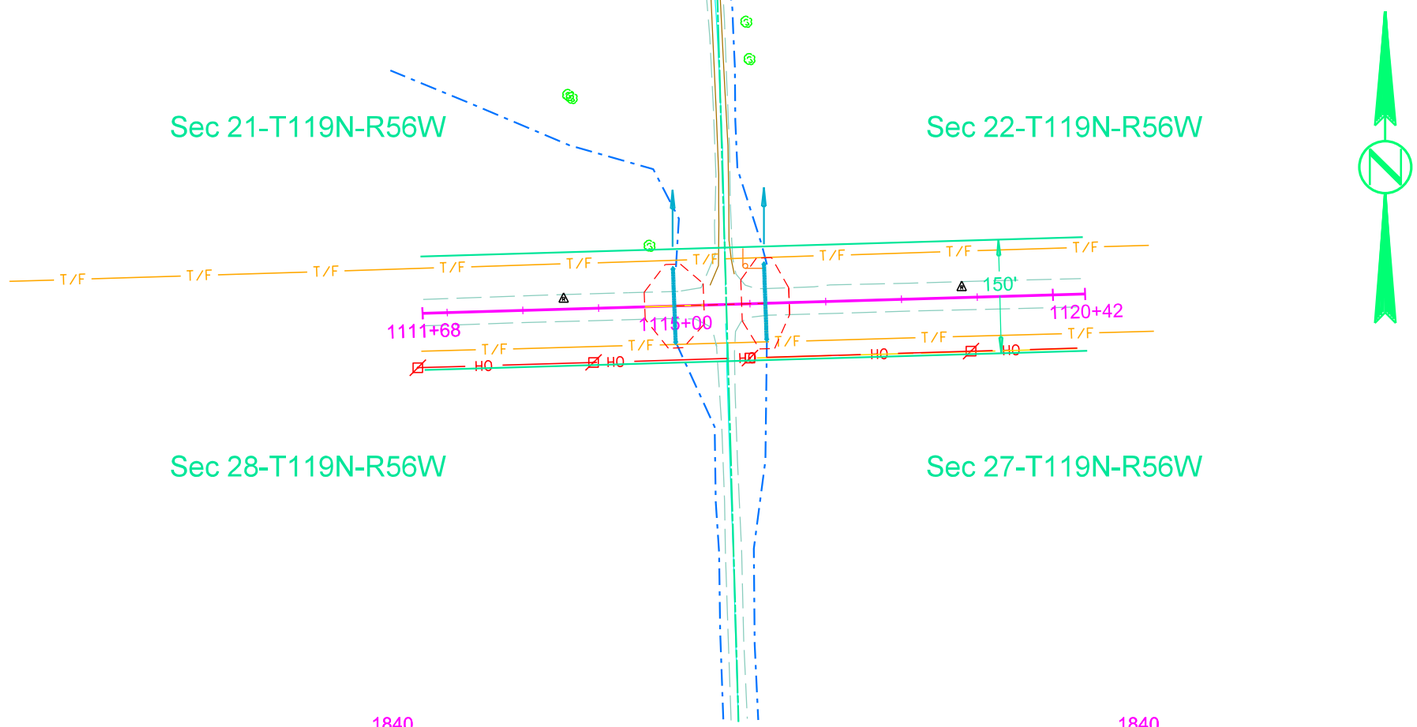
Section Line

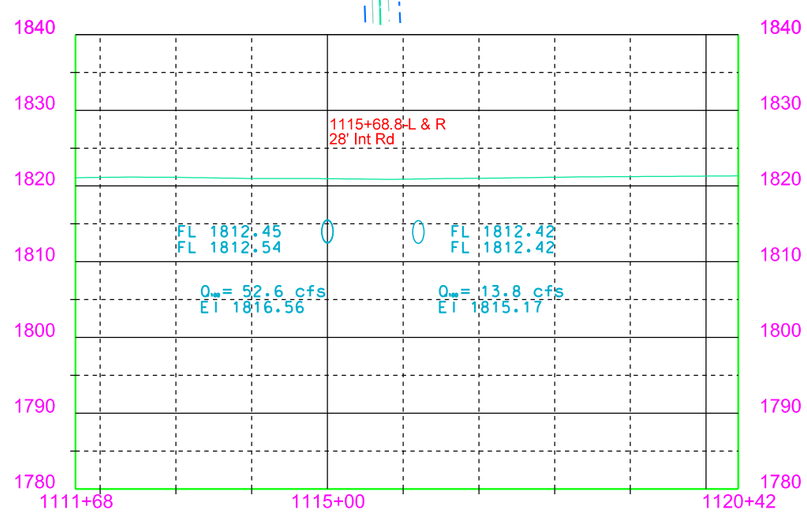
Sec 21-T119N-R56W

Sec 22-T119N-R56W

Sec 28-T119N-R56W

Sec 27-T119N-R56W





BM #16 Elev 1820.74
Sta 1113+54.32 - 13.10' L

BM #17 Elev 1820.89
Sta 1118+80.14 - 13.10' L

PLOT SCALE - 1:200

PLOT NAME - 5

FILE - ...\CLRK04JG\FLOW\025VCULVERTS.DGN

PLOTTED FROM - TRAB12222

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0020(124)363	56	109

Plotting Date: 01/07/2016

Revised 01/05/2016

1158+00
Remove 4'X6' Cattle Pass
End Section L and R

1158+00 (4 ac)
Install 24"-84' RCP
and 2 Sloped Ends
and Control Density Fill

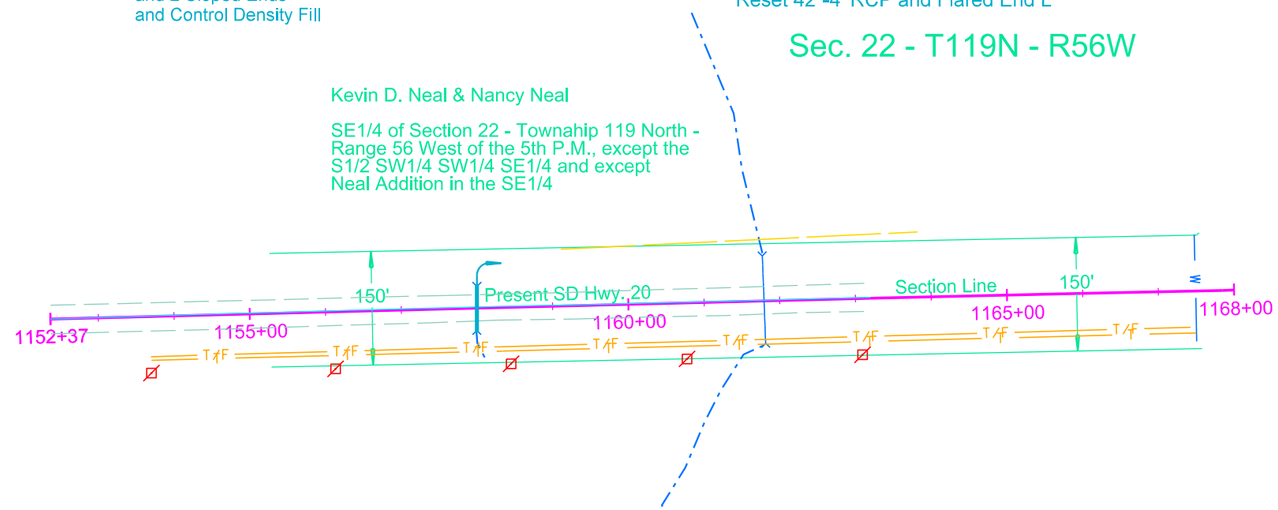
1161+80
Retain Existing 42" RCP

1161+80
Remove for Reset 42"-4' RCP and Flared End R
Remove for Reset 42" 8' RCP and Flared End L
Reset 42"-4' RCP and Flared End R
Reset 42"-4' RCP and Flared End L

Sec. 22 - T119N - R56W

Kevin D. Neal & Nancy Neal

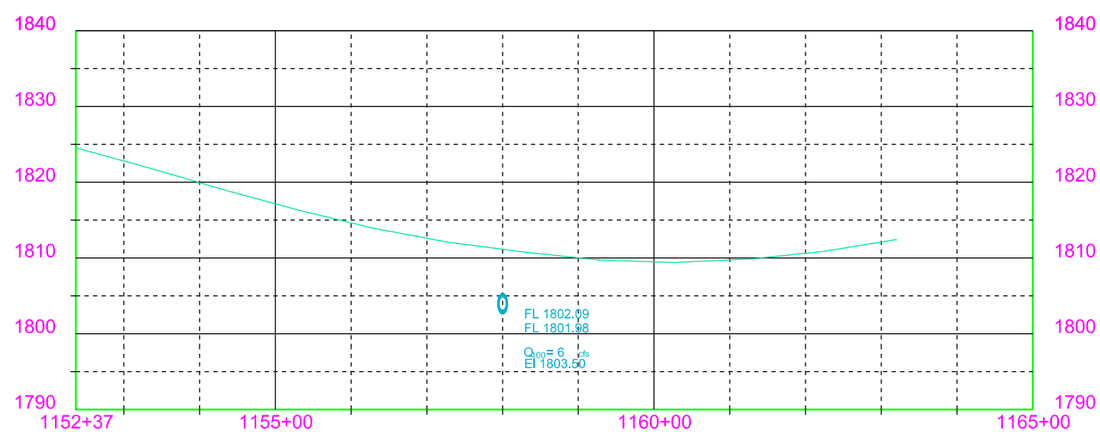
SE1/4 of Section 22 - Townahip 119 North - Range 56 West of the 5th P.M., except the S1/2 SW1/4 SW1/4 SE1/4 and except Neal Addition in the SE1/4



Kevin D. Neal & Nancy Neal

NE1/4 of Section 27 - Township 119 North - Range 56 West of the 5th P.M.

Sec. 27 - T119N - R56W



PLOT SCALE - 1:200

PLOT NAME - 6

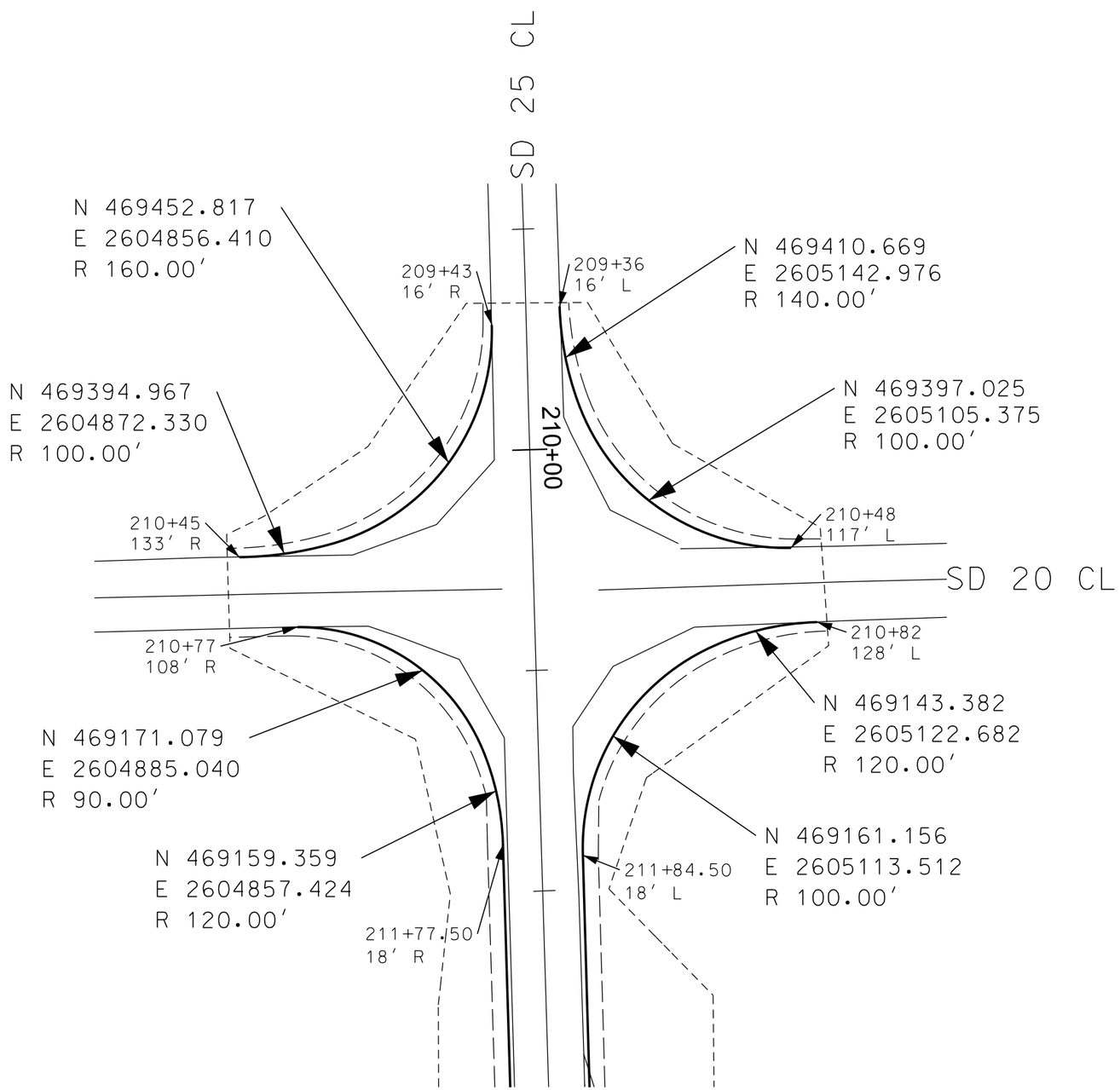
FILE - ...\REGIONA\PRJ\CLRK02\1152.DGN

PLOTTED FROM - TRAB12222

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	PH 0025(77)164 P 0020(124)363	57	109

Plotting Date: 12/29/2015

INTERSECTION LAYOUT



Edge of Existing Pavement

Edge of Subgrade

Edge of Asphalt Concrete

Edge of Work Limits

PLOT SCALE - 1:58.5

PLOTTED FROM - TRAB12222

PLOT NAME - 2

FILE - ...\CLRK04J6\04J6INTERSECTION.DGN

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0020(124)363	58	109
Plotting Date: 01/07/2016			

Revised 01/05/2016

Additional Culvert Repair Detail

876+80
Retain Existing 24" CMP

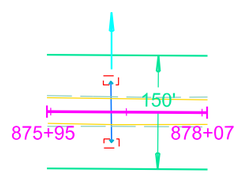
876+80
Install 24" CMP Sloped End L & R

1078+80
Retain Existing 36" RCP

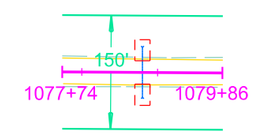
1078+80
Remove for Reset 36"-12' RCP L & R
Remove for Reset 36" RCP Flared End L & R
Reset 36"-12' RCP L & R
Reset 36" RCP Flared End L & R

1078+80
Culvert Joint Cleaning 36" RCP
Repair Culvert Joint 36" RCP
Chemical Grout Void Fill 36" RCP

Sec 23-T119N-R57W



Sec 21-T119N-R56W



Sec 26-T119N-R57W

Sec 28-T119N-R56W

PLOT SCALE - 1:200

PLOT NAME - 7

FILE - ...\025VCROSSSECTIONSS.DGN

PLOTTED FROM - TRAB12222

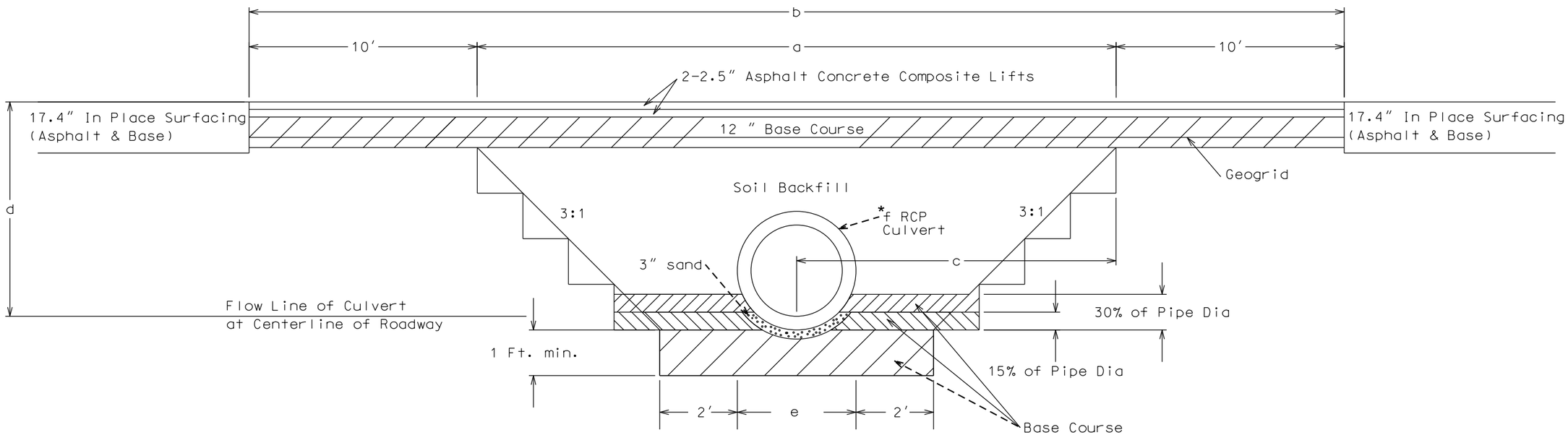
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0020(124)363	59	109

Plotting Date: 12/29/2015

CULVERT REPLACEMENT DETAIL

*Pipe Diameter

DRAWING
NOT TO SCALE



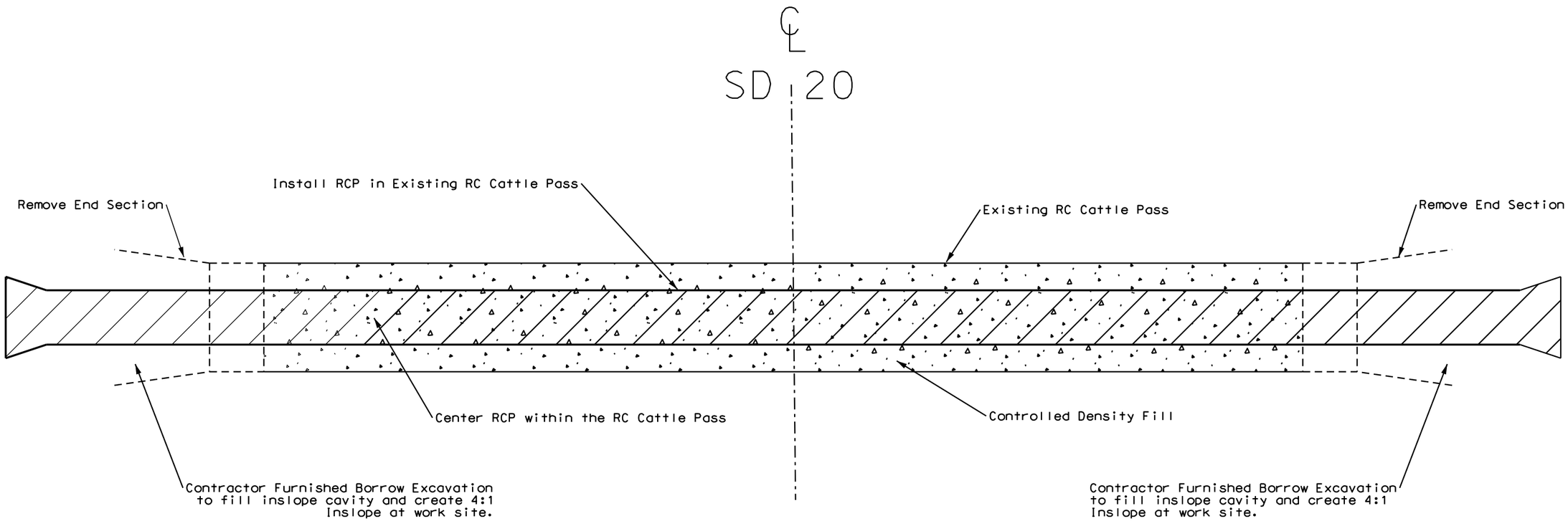
Station	a	b	c	d	e	*f
803+10	30'	50'	15'	6.0'	2.5'	24"
830+90	55'	75'	27.5'	10.1'	3.1'	30"
850+00	47'	67'	23.5'	8.9'	2.5'	24"
896+00	61'	81'	30.5'	11.2'	2.5'	24"
1043+00	63'	83'	31.5'	11.5'	2.5'	24"
1115+00	58'	78'	29'	8.8'	3.7'	36"
1116+20	43'	63'	21.5'	8.2'	2.5'	24"

PLOT SCALE - 1:1.2
PLOT NAME - 5
FILE - ...\025V_CULVERT REPLACEMENT.DGN
PLOTTED FROM - TRAB12222

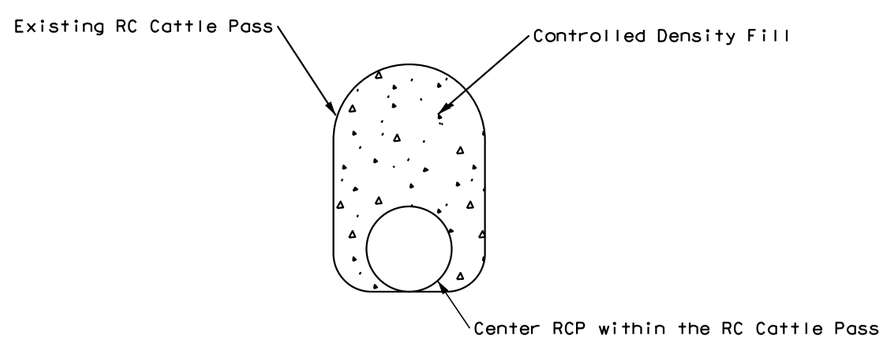
INSTALLING 24" RCP IN EXISTING RC CATTLE PASS

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P 0020(124)363	60	109

Plotting Date: 12/29/2015



Plan View



Elevation View

PLOT SCALE - 1:4

PLOTTED FROM - TRAB12222

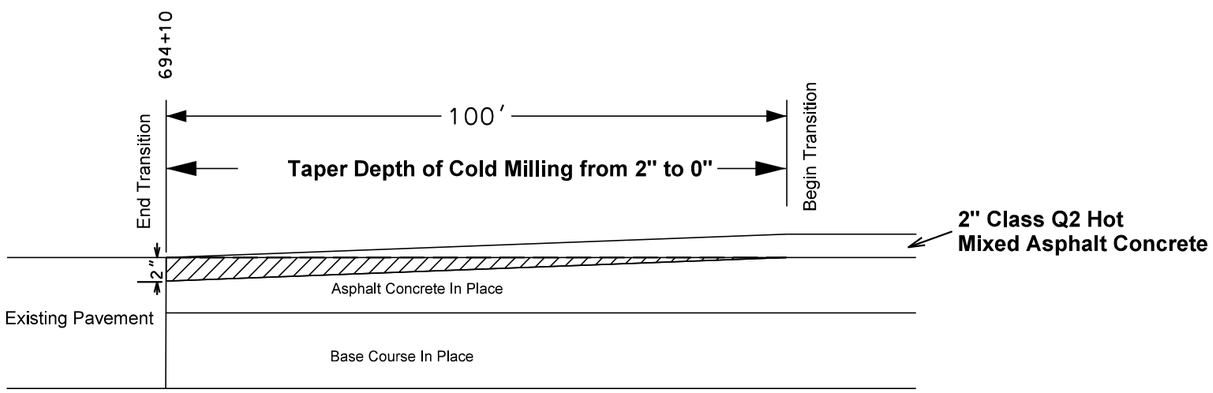
PLOT NAME - 6

FILE -...\4'X6' CATTLE PASS PLUG.DGN

TRANSITION DETAILS FOR 025V PROJECT LIMITS AND RURAL FARM ENTRANCE ON SD 20

TRANSITION SECTION

Begin Resurfacing Project



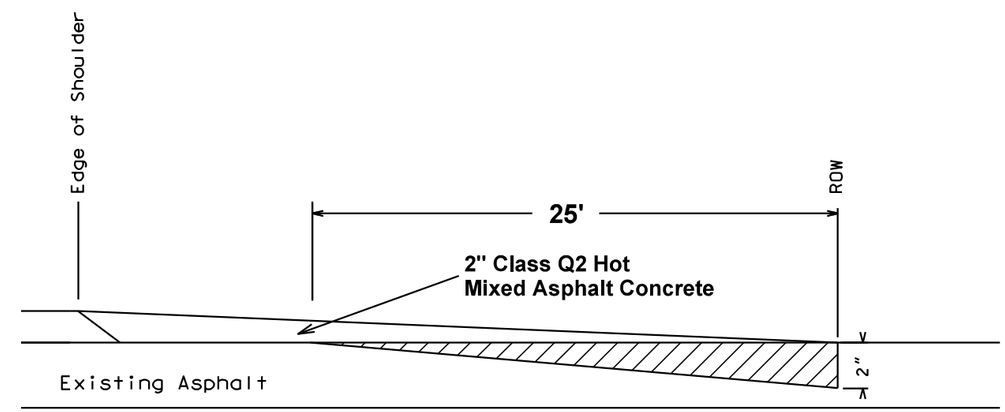
Cold Milling Asphalt Concrete

Note: Width of Cold Milling Asphalt Concrete at Beginning of project is approximately 31 feet wide.

Cost for tapering the width and depth of cold milling shall be incidental to the contract unit price per square yard for Cold Milling Asphalt Concrete, unless otherwise indicated.

TRANSITION SECTION

Intersecting Roads
Sta. 851+46.7 Rt
Sta. 886+85 Rt



Cold Milling Asphalt Concrete

Intersecting Roads Approximate Width, 30 Feet.

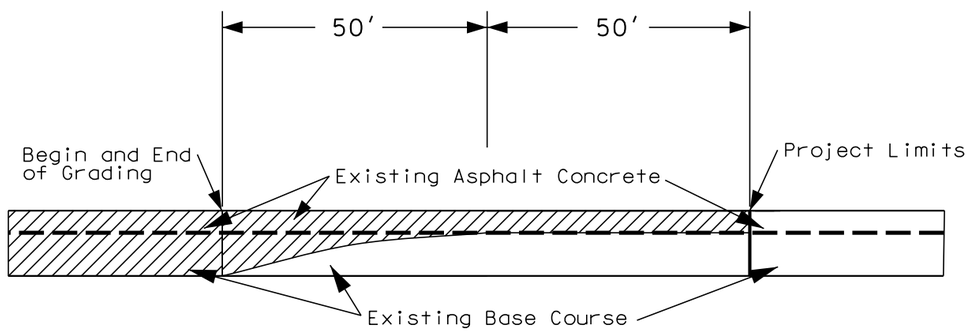
Included in the Table of Additional Quantities for these Intersecting Roads is 168 sq. yds. of Cold Milling Asphalt Concrete. Basis of payment shall be plans quantity regardless of width of these Intersecting Roads.

PLOT SCALE - 1:20000
PLOTTED FROM - TRAB12222
PLOT NAME - 7
FILE - ...\CLRK025V\025V COLD_MILLING.DGN

TRANSITION DETAILS FOR 04J6 PROJECT LIMITS ON SD 25

TRANSITION SECTION

Begin Project
End Project

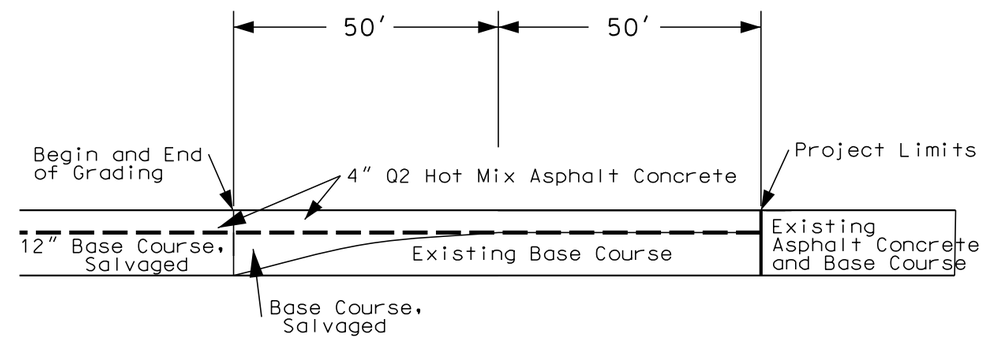


Salvage and Stockpile Asphalt Mix and Granular Base Material

Included in the Table of Additional Quantities for these transition areas are 362 tons of Salvage and Stockpile Asphalt Mix and Granular Base Course Material.

TRANSITION SECTION

Begin Project
End Project



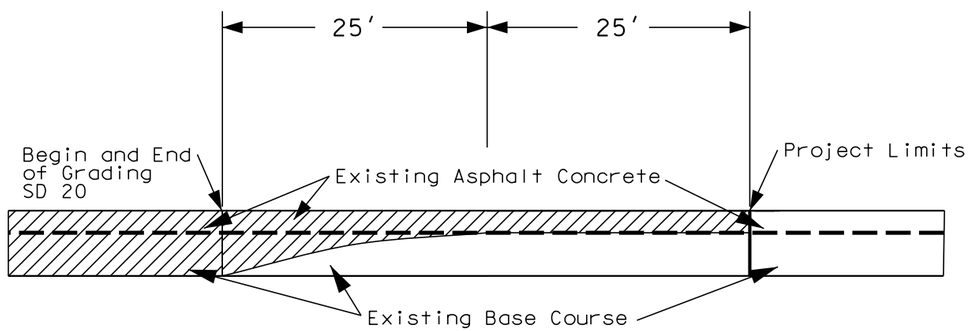
Note: Width of Q2 Hot Mix Asphalt Concrete in transition area shall match adjacent surfacing widths.

PLOT SCALE - 1:20000
PLOTTED FROM - TRAB12222
PLOT NAME - 8
FILE - ...\CLRK025V\025V COLD_MILLING.DGN

TRANSITION DETAILS FOR 04J6 PROJECT LIMITS ON SD 20 EAST AND WEST OF SD 25

TRANSITION SECTION

Begin Project
End Project

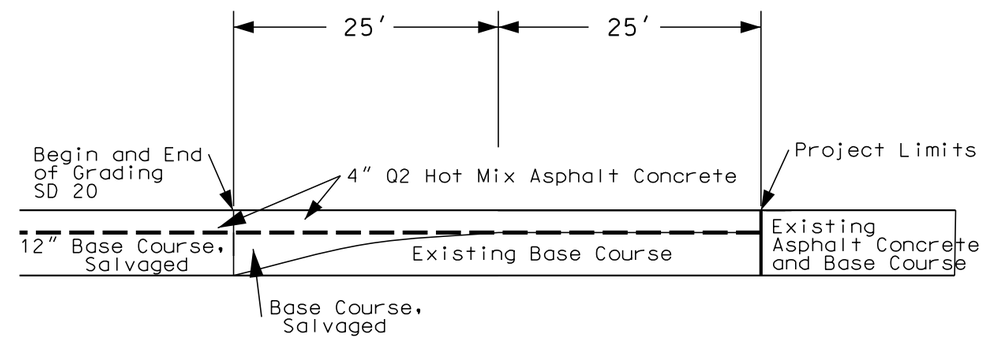


Salvage and Stockpile Asphalt Mix and Granular Base Material

Included in the Table of Additional Quantities for these transition areas are 212 tons of Salvage and Stockpile Asphalt Mix and Granular Base Course Material.

TRANSITION SECTION

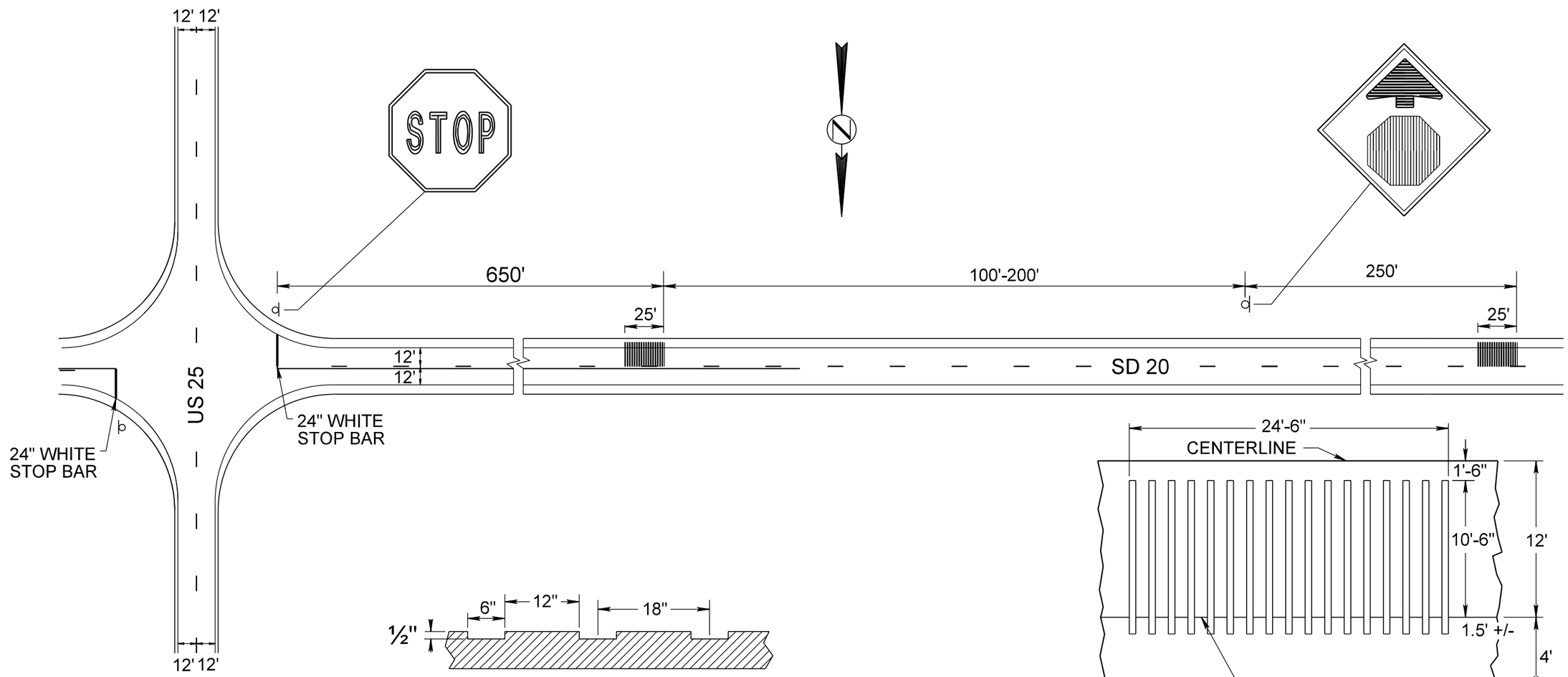
Begin Project
End Project



Note: Width of Q2 Hot Mix Asphalt Concrete in transition area shall match adjacent surfacing widths.

PLOT SCALE - 1:20000
PLOTTED FROM - TRAB12222
PLOT NAME - 9
FILE - ...\CLRK025V\025V COLD_MILLING.DGN

RECESSED RUMBLE STRIP LAYOUT



RUMBLE STRIP PROFILE (TYPICAL)

RUMBLE STRIP PLAN VIEW

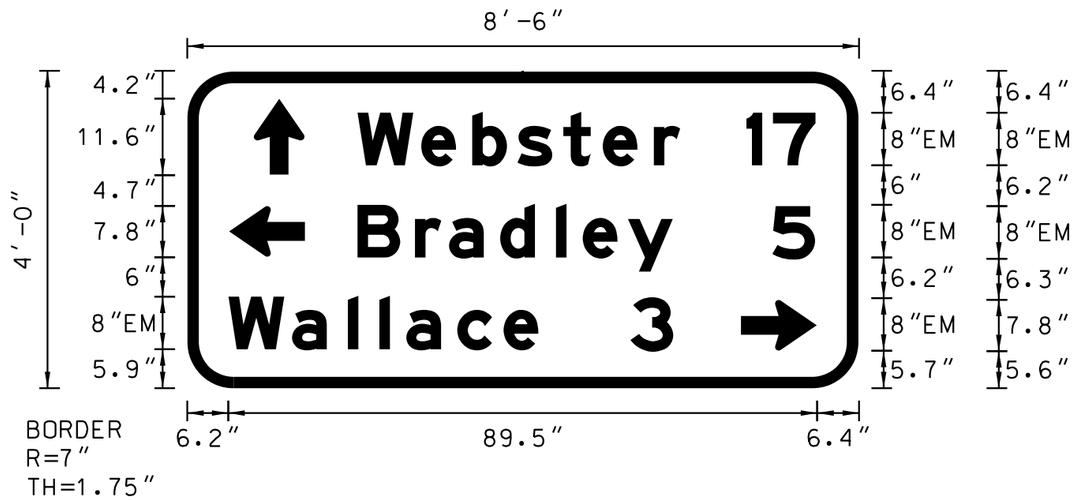
THE RUMBLE STRIPS SHALL BE ROUTED OR CUT INTO THE ASPHALT CONCRETE SURFACE. THE RUMBLE STRIP CUTS SHOULD EXTEND PAST THE EDGE OF THE DRIVING LANE TO ALLOW FOR DRAINAGE.

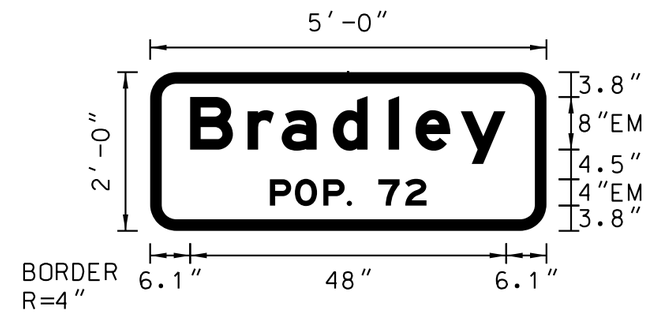
PLOT SCALE - 1:70
PLOT NAME - 1Ø
FILE - ...\PRJ\CLRK\Ø25V\Ø25V RMBLPVMT.DGN
PLOTTED FROM - TRAB12222

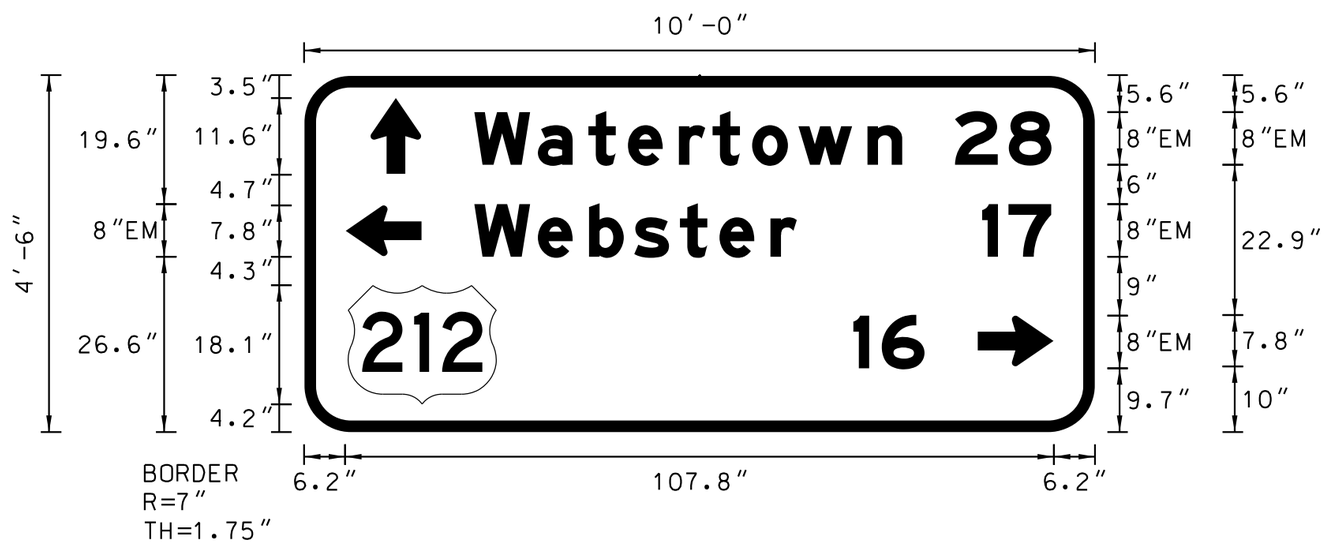
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	PH 0025(77)164 P 0020(124)363	65	109

Plotting Date: 12/02/2015

SPECIAL SIGN DESIGN







All signs on this sheet shall have a green background with white legend and white border

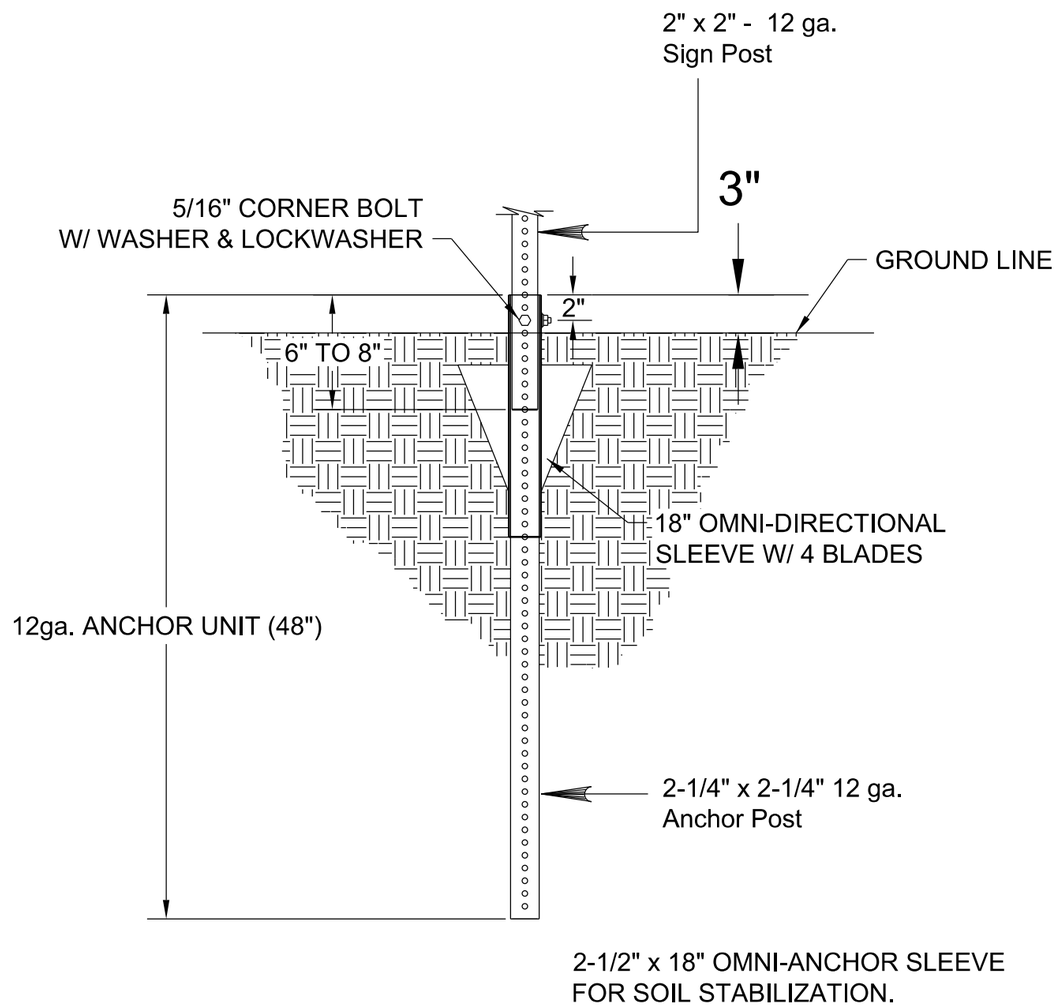
PLOT SCALE - 1:1.91888

PLOTTED FROM - TRAB10100

PLOT NAME - 1

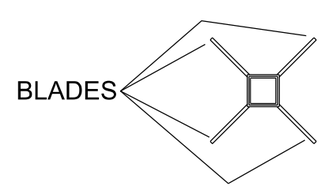
FILE -...\SPECIAL SIGN DESIGN.DGN

SQUARE TUBE
4 BLADE ANCHOR DETAIL



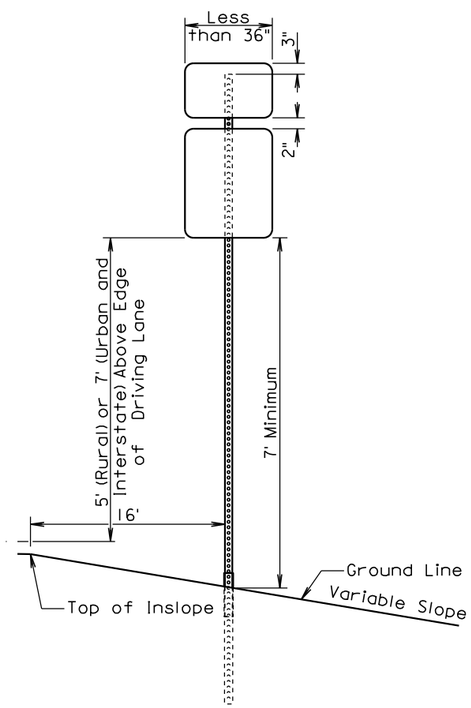
2-1/2" x 18" 12 ga. Omni-Sleeve

ANCHOR SLEEVE
TOP VIEW

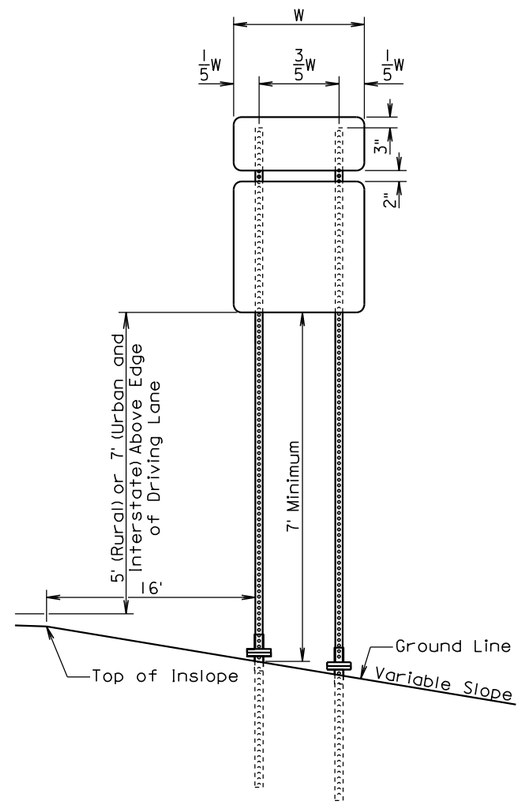


PLOT SCALE - 1:200
PLOTTED FROM - TRAB10100
PLOT NAME - 1
FILE - ...\SIGN POST INSTALL DETAILS.DGN

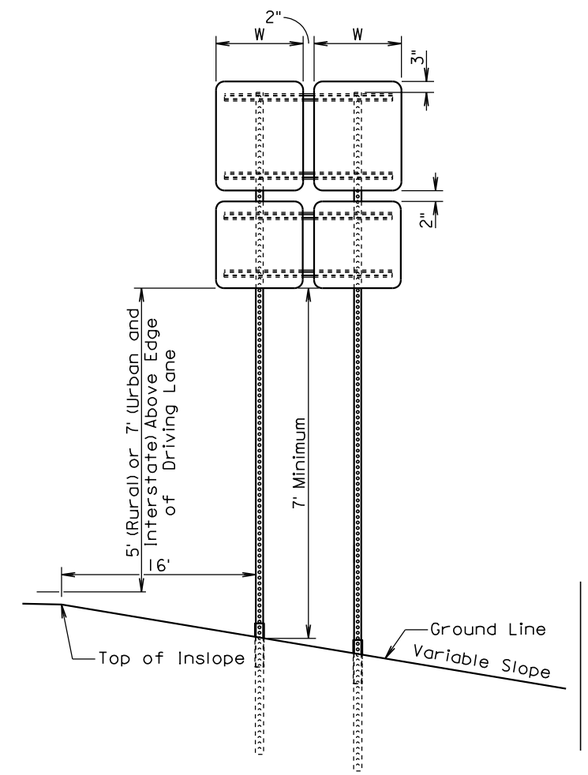
INSTALLATION DETAILS FOR MULTIPLE SIGN ASSEMBLIES



ELEVATION VIEW
(Single post assembly)



ELEVATION VIEW
(Double post assembly)



ELEVATION VIEW
(Double post assembly)

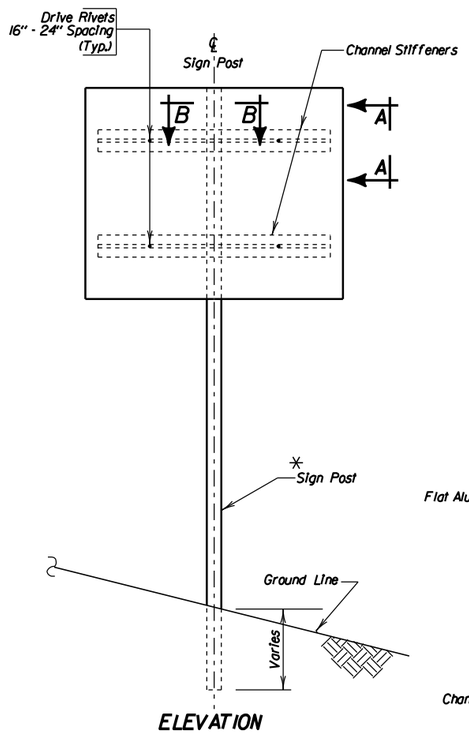
GENERAL NOTES:

The sign posts and bases shown are for illustrative purpose. The post type required shall be the type specified in the plans.

All breakaway sign supports shall comply with NCHRP 350 or MASH crash testing requirements and FHWA requirements. The Contractor shall provide post installation details at the preconstruction meeting for all breakaway sign support assemblies.

PLOT SCALE - 1:200
PLOTTED FROM - TRAB10100
PLOT NAME - 2
FILE - ...\SIGN POST INSTALL DETAILS.DGN

ONE POST BREAKAWAY SIGN SUPPORTS



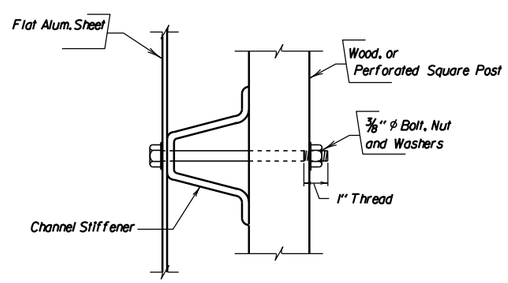
ELEVATION

Ø A plastic washer, as recommended by the sheeting manufacturer, shall be installed between the sign face and the metal washer shown.

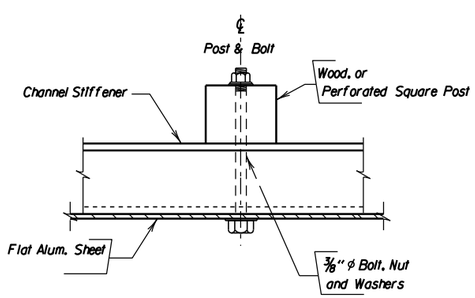
Height and lateral distance as recommended by latest edition of MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

✳ Single post installation shown. (See applicable Details or Standard Plates shown in these plans for multiple post spacing requirements.)

(Typical Sign and Stiffener Details)

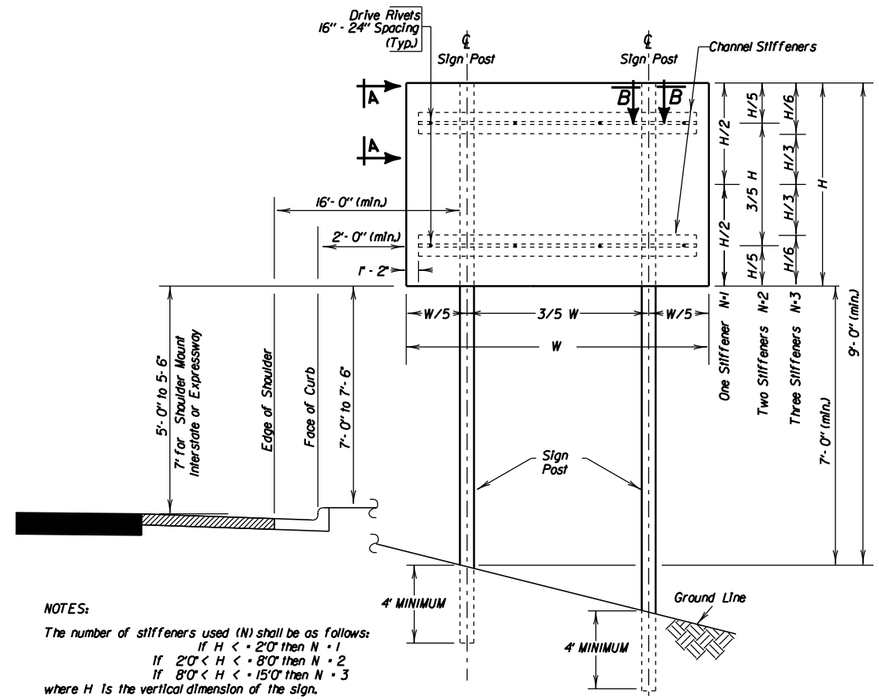


SEC. A-A



SEC. B - B

TWO POST BREAKAWAY SIGN SUPPORTS



NOTES:

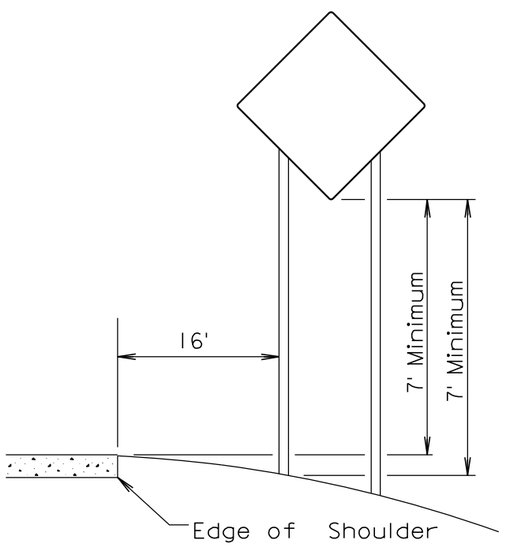
The number of stiffeners used (N) shall be as follows:

If H < = 2'0" then N = 1
If 2'0" < H < = 8'0" then N = 2
If 8'0" < H < = 15'0" then N = 3

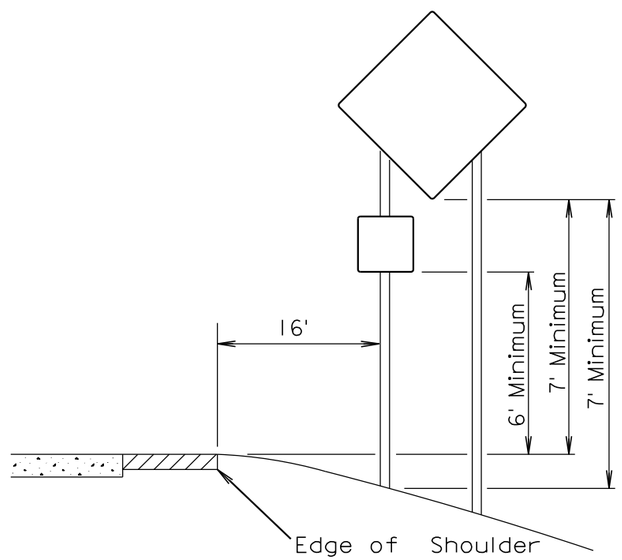
where H is the vertical dimension of the sign.

A minimum of two bolts shall be required to fasten the sign to each post.

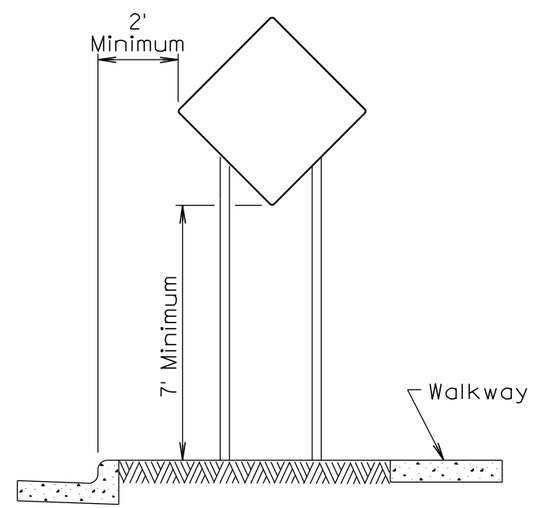
SIGN SUPPORTS
(Lateral Off–Sets)



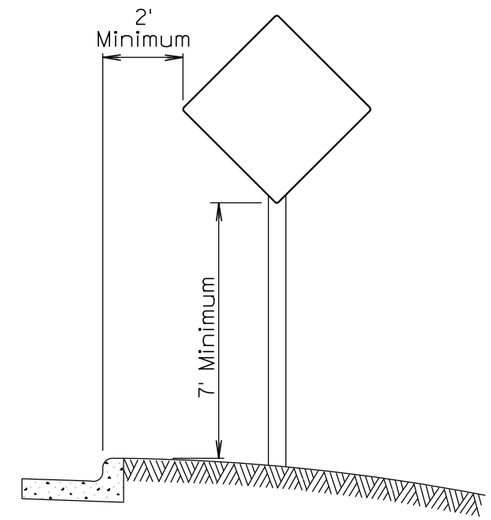
RURAL DISTRICT



RURAL DISTRICT WITH
SUPPLEMENTAL PLATE

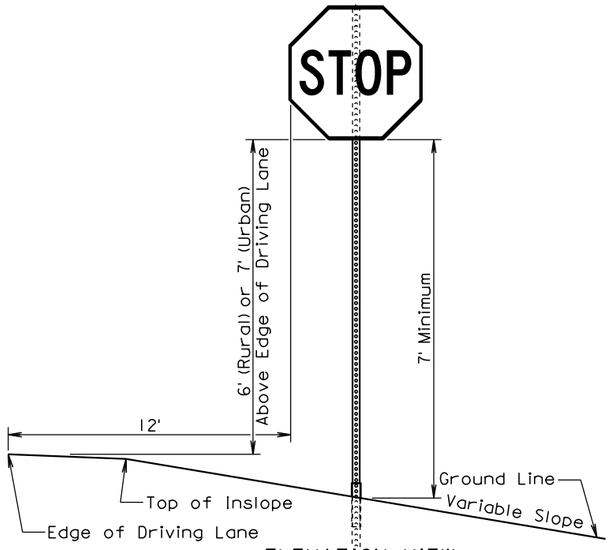


URBAN DISTRICT



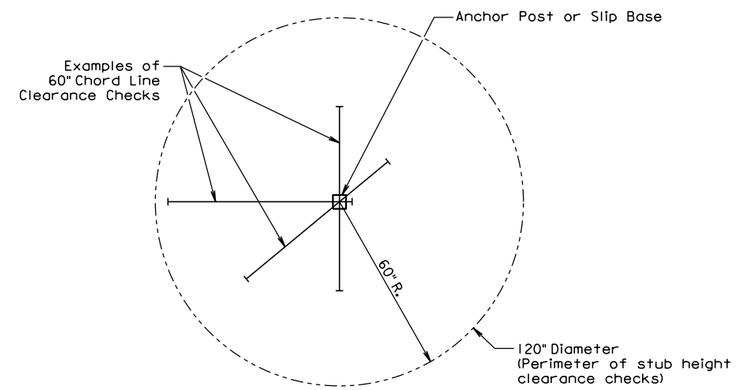
URBAN DISTRICT

INSTALLATION DETAILS FOR STOP SIGNS

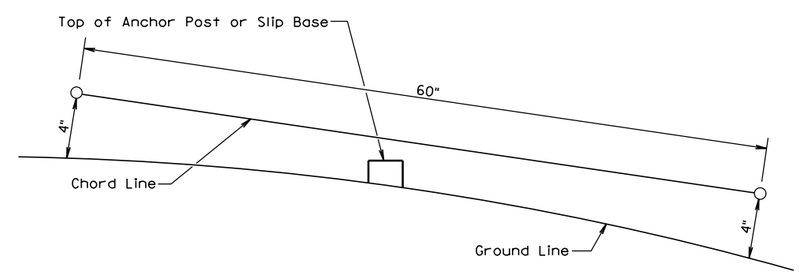


ELEVATION VIEW
(Single post assembly)

BREAKAWAY SUPPORT STUB CLEARANCE



PLAN VIEW
(Examples of stub height clearance checks)



ELEVATION VIEW

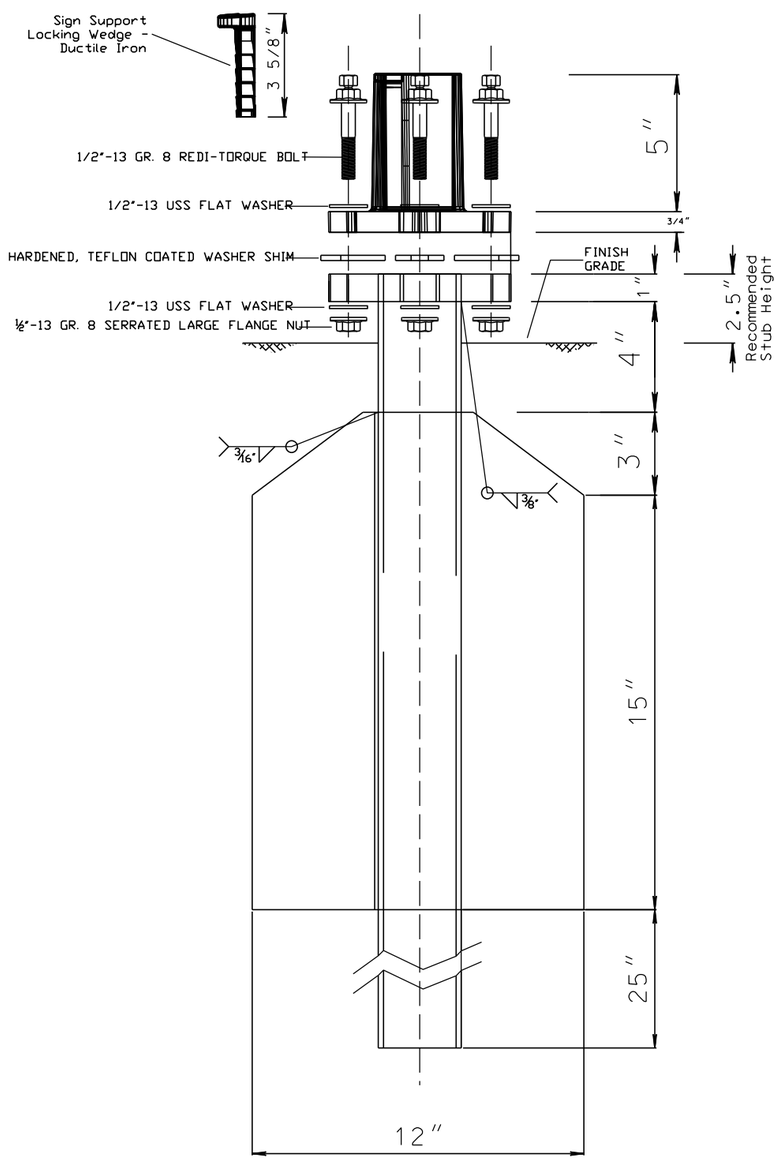
GENERAL NOTES:

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

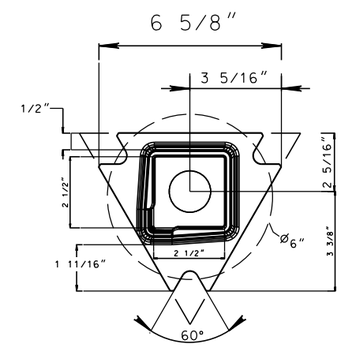
At locations where there is curb and gutter adjacent to the breakaway sign support, the stub height shall be a maximum of 4" above the ground line at the localized area adjacent to the breakaway support stub.

PLOT SCALE - 1:200
PLOTTED FROM - TRAB10100
PLOT NAME - 5
FILE - ...\SIGN POST INSTALL DETAILS.DGN

48" WINGED ANCHOR SLIP BASE



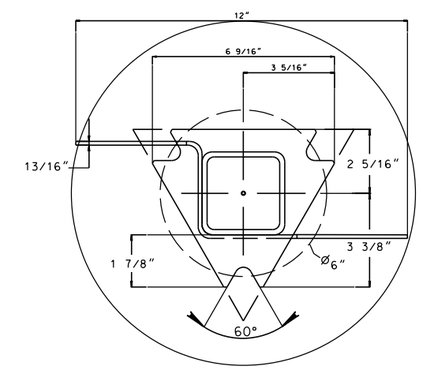
TOP POST RECEIVER for 2-½" SQUARE POST



MATERIAL:
DUCTILE IRON CASTING, CLASS 65-45-12

TRAFFIC FLOW

BOTTOM UNIBASE SOIL STUB

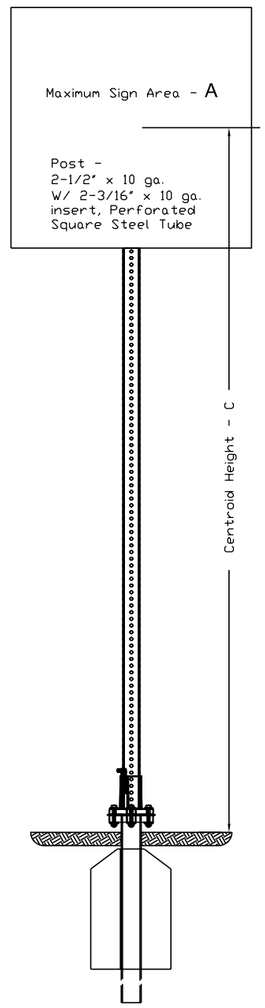


MATERIALS:
Tube - 3" x 3" x 7 ga. ASTM A500 Grade B tube
Stabilizing Wing - 7 ga. H.R.P.O. ASTM A 569
Plate - ASTM A572 grade 50

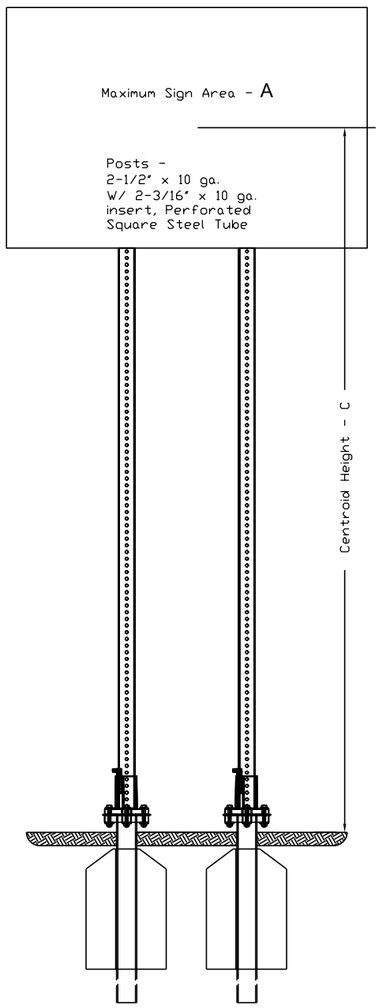
PLOT SCALE - 1:0.88
PLOTTED FROM - TRAB10100
PLOT NAME - 6
FILE - ...\WINGED ANCHOR SLIP BASE 1-09.DGN

48" WINGED SLIP BASE

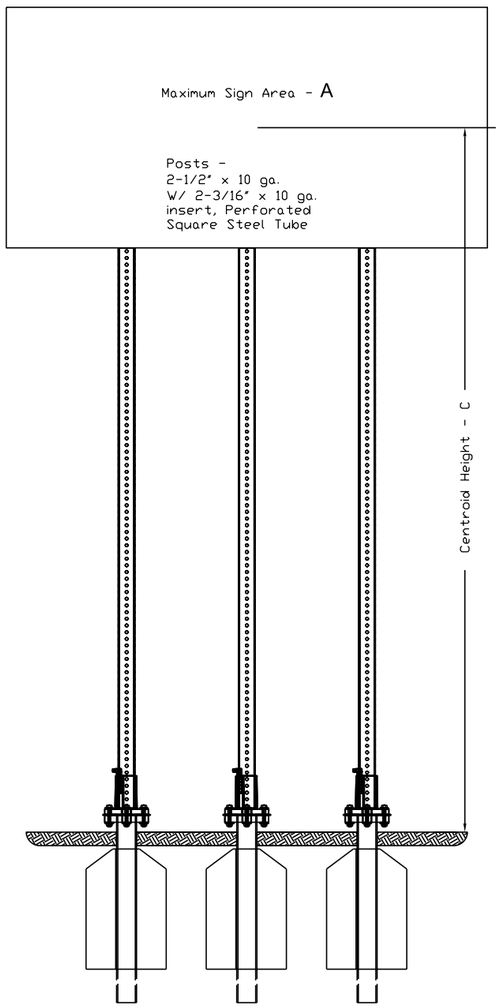
Post and Wind Load Information



centroid - C	Maximum Sign Area - A
8 ft.	42 ft²
9 ft.	38 ft²
10 ft.	34 ft²
11 ft.	30 ft²
12 ft.	28 ft²
13 ft.	26 ft²
14 ft.	24 ft²
15 ft.	22 ft²
16 ft.	20 ft²

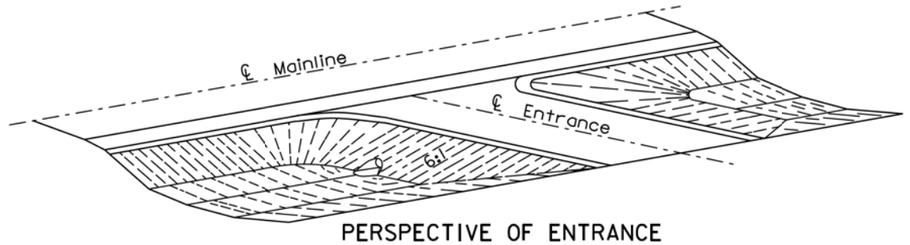


centroid - C	Maximum Sign Area - A
8 ft.	84 ft²
9 ft.	76 ft²
10 ft.	68 ft²
11 ft.	60 ft²
12 ft.	56 ft²
13 ft.	52 ft²
14 ft.	48 ft²
15 ft.	44 ft²
16 ft.	40 ft²

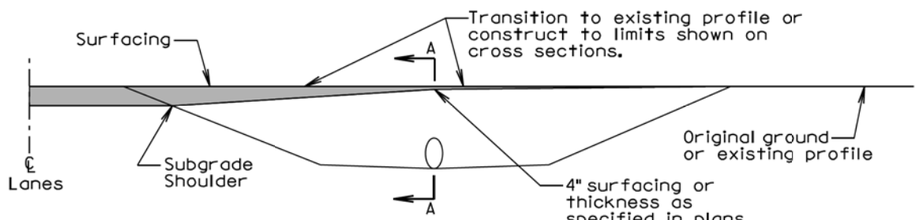


centroid - C	Maximum Sign Area - A
8 ft.	126 ft²
9 ft.	114 ft²
10 ft.	102 ft²
11 ft.	90 ft²
12 ft.	84 ft²
13 ft.	78 ft²
14 ft.	72 ft²
15 ft.	66 ft²
16 ft.	60 ft²

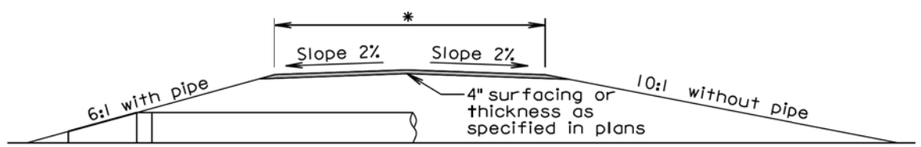
PLOT SCALE - 1:0.88
PLOTTED FROM - TRAB10100
PLOT NAME - 7
FILE - ...\WINGED ANCHOR SLIP BASE 1-09.DGN



PERSPECTIVE OF ENTRANCE



ELEVATION VIEW (ENTRANCE)



SECTION A-A (ENTRANCE)

*The finished surfacing width is stated elsewhere in the plans. The subgrade width is 4' wider than the finished surfacing width unless stated otherwise in the plans.

GENERAL NOTES:

The ditch section shown above in the perspective and elevation view is only for illustrative purposes.

A 6:1 inslope shall be constructed for an entrance when a pipe is required. A 10:1 inslope shall be constructed when a pipe is not required.

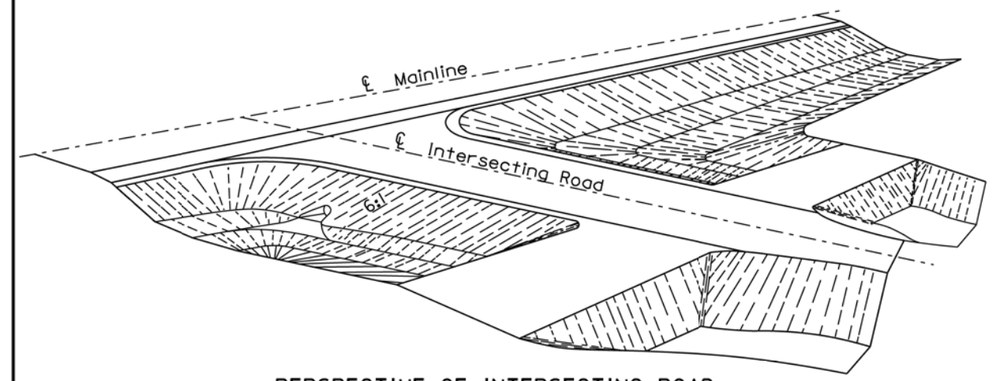
Pipe lengths shall be adjusted if necessary during construction to obtain the 6:1 slopes. For grading projects, the pipe lengths are estimated typically using a 4" thickness of surfacing directly over the subgrade above the pipe.

The transition area between the mainline inslope and the approach inslope for entrances shall be rounded to eliminate an abrupt transition.

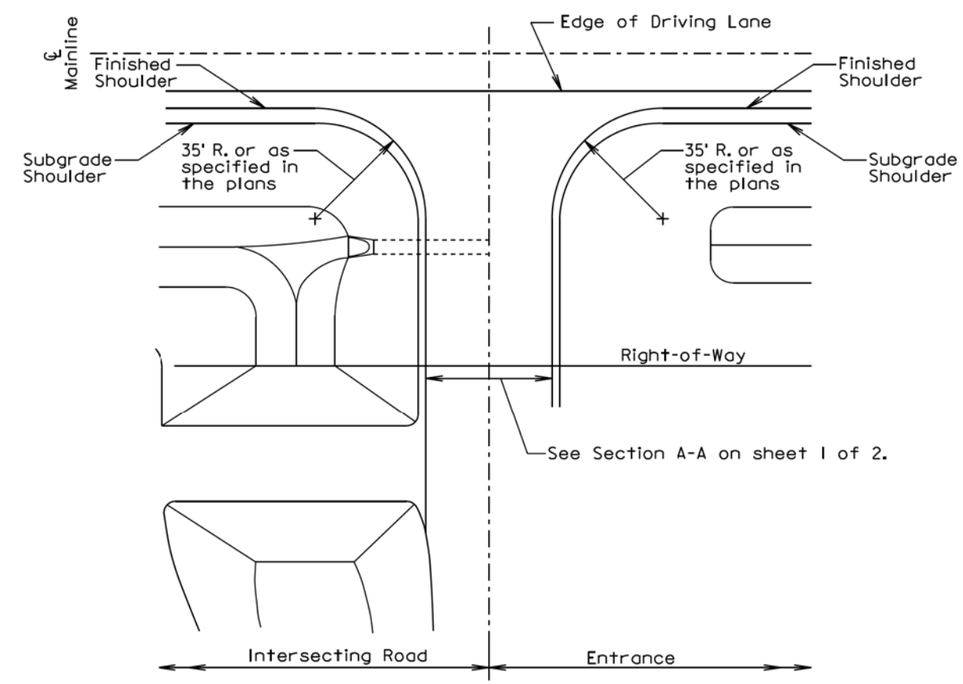
The turning radii shall be 35' for intersecting roads and entrances unless stated otherwise in the plans.

September 6, 2013

Published Date: 4th Qtr. 2015	SDDOT	INTERSECTING ROADS AND ENTRANCES	PLATE NUMBER 120.01
			Sheet 1 of 2



PERSPECTIVE OF INTERSECTING ROAD

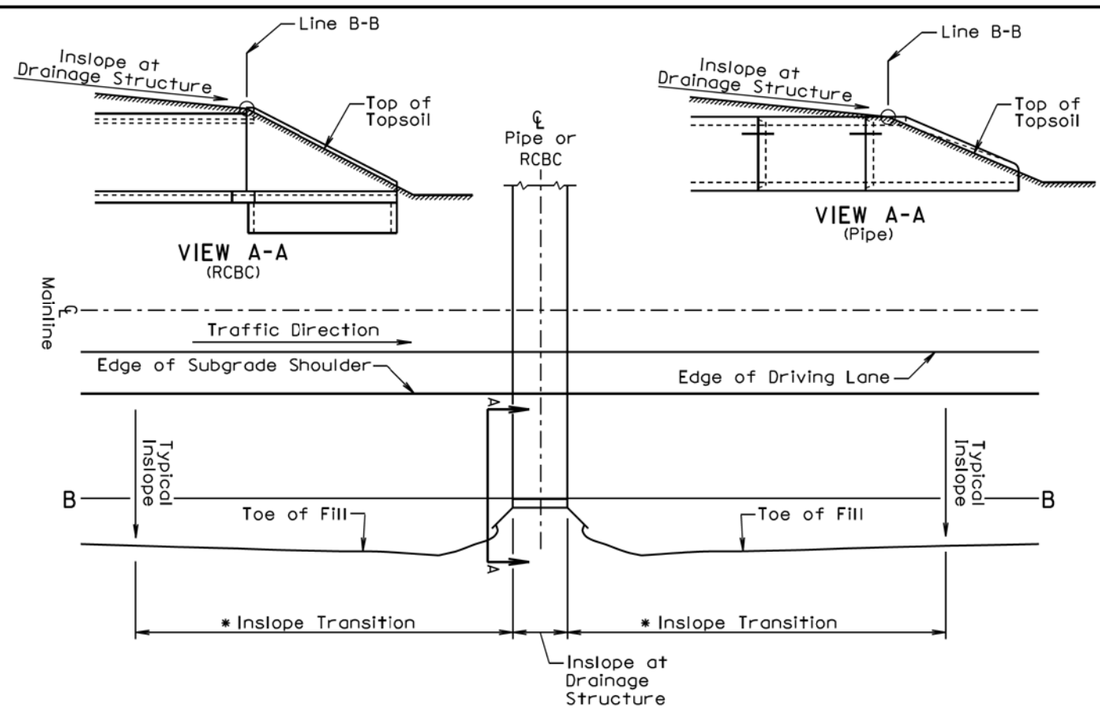


PLAN VIEW

September 6, 2013

Published Date: 4th Qtr. 2015	SDDOT	INTERSECTING ROADS AND ENTRANCES	PLATE NUMBER 120.01
			Sheet 2 of 2

PLOT SCALE - 1:200
PLOTTED FROM - TRAB12222
PLOT NAME - 1
FILE - ...\04J6_120.01_120.01.DGN



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 shall 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: 4th Qtr. 2015

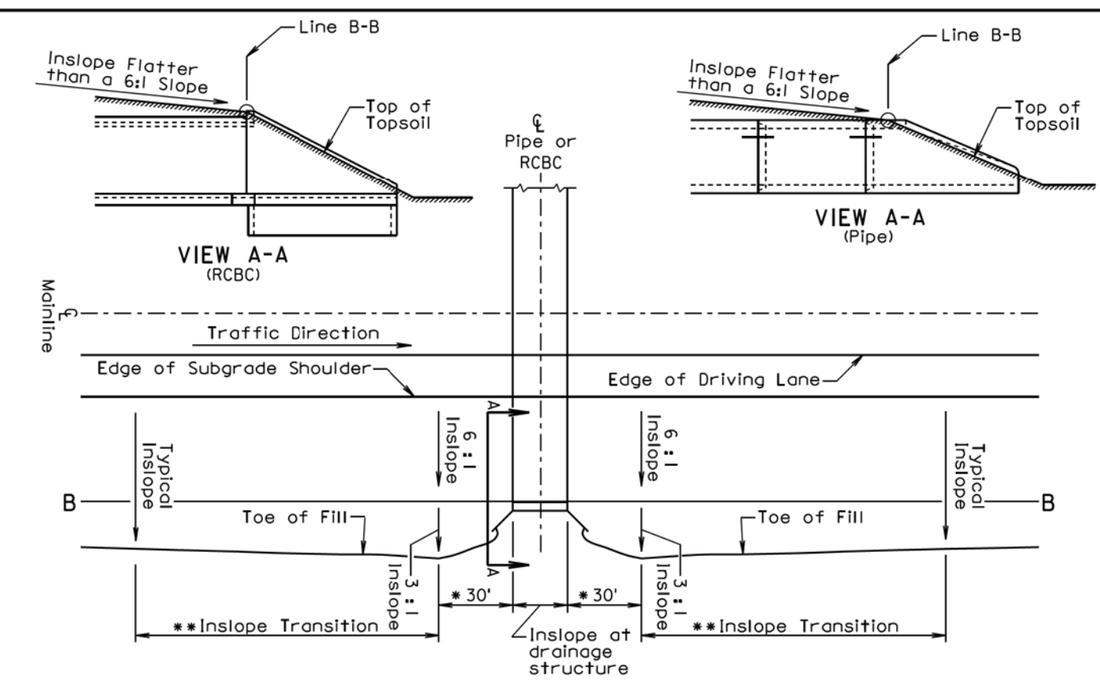
SDDOT

INSLOPE TRANSITIONS AT PIPE CULVERTS OR REINFORCED CONCRETE BOX CULVERTS

February 14, 2011

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 shall be transitioned to a 3:1 inslope within the transition length necessary for the transition within the clear zone.

Published Date: 4th Qtr. 2015

SDDOT

INSLOPE TRANSITIONS AT PIPE CULVERTS OR REINFORCED CONCRETE BOX CULVERTS

February 14, 2011

PLATE NUMBER 120.05

Sheet 2 of 2

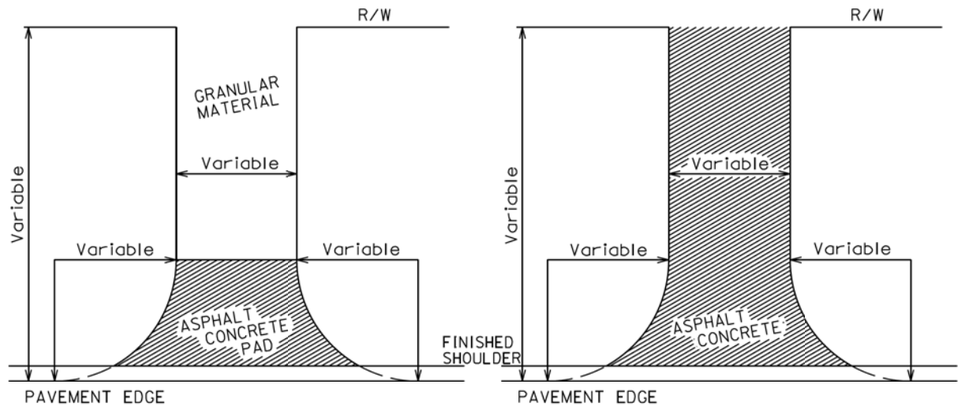
STATE OF SOUTH DAKOTA

PROJECT PH 0025(77)164 P 0020(124)363

Plotting Date: 12/17/2015

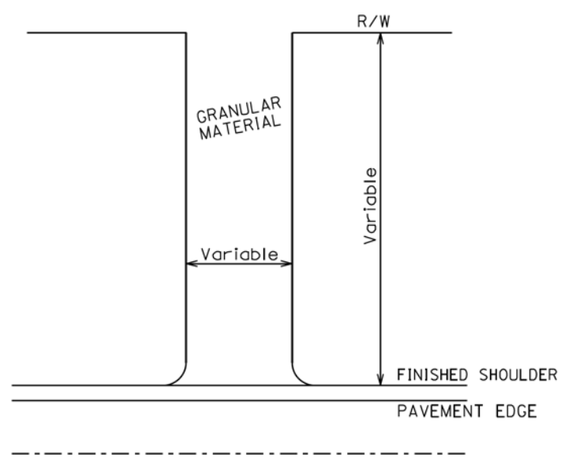
SHEET NO. 74

TOTAL SHEETS 109



INTERSECTING ROAD
NO ASPHALT CONCRETE SURFACING
BEYOND R/W

INTERSECTING ROAD
ASPHALT CONCRETE SURFACING
BEYOND R/W



ENTRANCE

The surfacing details shown on this sheet are provided as a guide for surfacing these facilities. The precise construction limits for situations other than the standards shown will be determined by the Engineer, at the time of construction.

ROADWAY WITH SHOULDER

March 31, 2000

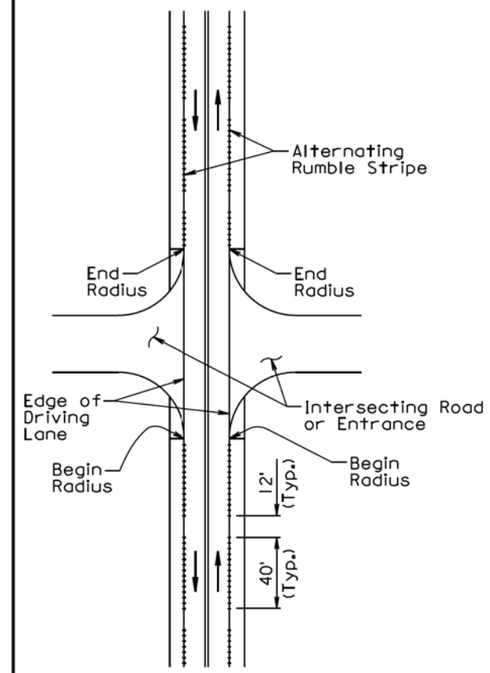
Published Date: 4th Qtr. 2015

SDDOT

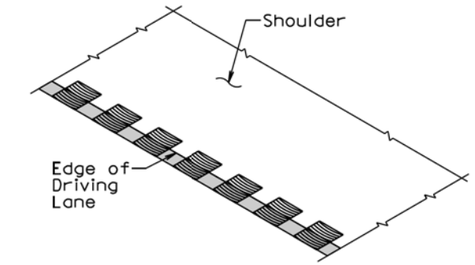
RESURFACING OF INTERSECTING ROADS AND ENTRANCES

PLATE NUMBER 320.11

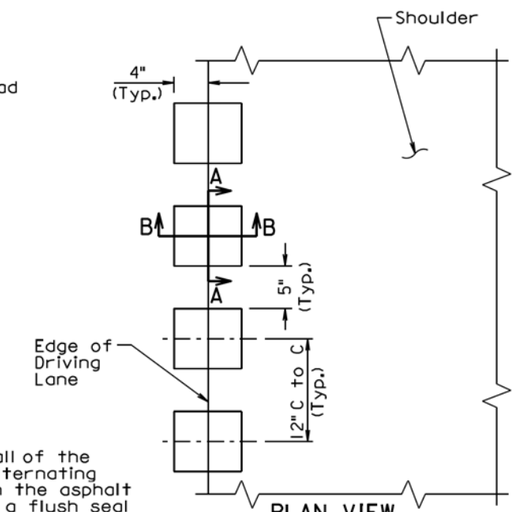
Sheet 1 of 1



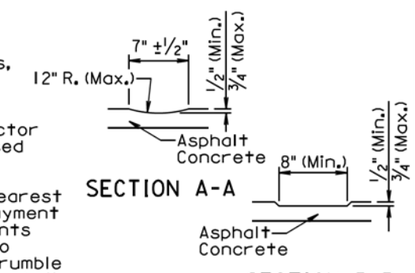
PLAN VIEW



PERSPECTIVE OF TYPICAL
RUMBLE STRIPE IN ASPHALT CONCRETE



PLAN VIEW
TYPICAL RUMBLE STRIPE
IN ASPHALT CONCRETE



SECTION A-A

SECTION B-B

GENERAL NOTES:

A rumble stripe shall be constructed on all of the asphalt concrete shoulders by grinding alternating patterns of 40' continuous indentations in the asphalt concrete. The rumble stripe shall receive a flush seal with the shoulder flush sealing or asphalt surface treatment.

A rumble stripe shall not be constructed through intersecting roads, entrances, and turnouts. The lengths of the 40' segments with continuous indentations and the 12' segments without a rumble stripe adjacent to the intersecting roads, entrances, and turnouts shall be adjusted as approved by the Engineer.

Prior to constructing the rumble stripe the Contractor shall submit to the Engineer, for approval, the proposed method of constructing the rumble stripe.

Measurement of the rumble stripe shall be to the nearest 0.1 of a mile for each shoulder. Measurement and payment of the rumble stripe shall include the 12' long segments without rumble stripes and the segments adjacent to intersecting roads, entrances, and turnouts without rumble stripes. Payment for constructing the rumble stripe shall be at the contract unit price per mile for "Grind 8" Rumble Strip or Stripe in Asphalt Concrete".

June 26, 2011

Published Date: 4th Qtr. 2015

SDDOT

8" RUMBLE STRIPE IN ASPHALT CONCRETE ON NONDIVIDED HIGHWAY SHOULDERS

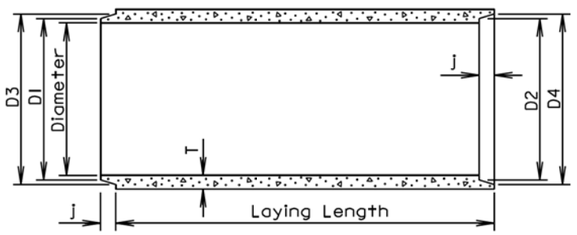
PLATE NUMBER 320.20

Sheet 1 of 1

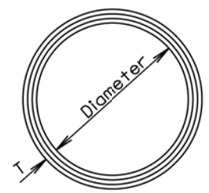
PLOT SCALE - 1:200
PLOTTED FROM - TRAB12222
PLOT NAME - 3
FILE - ...\04J6_320.11_320.20.DGN

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 7/8
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 7/8
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

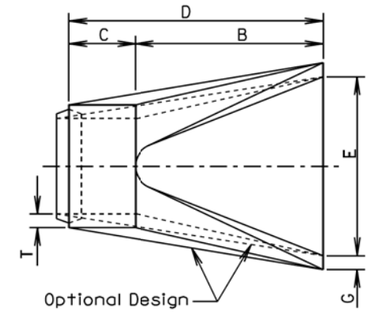
Published Date: 4th Qtr. 2015

SDDOT

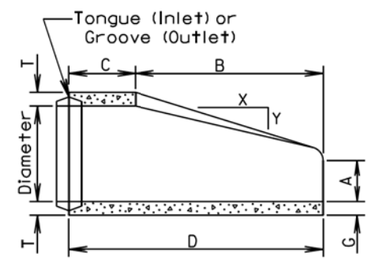
REINFORCED CONCRETE PIPE

PLATE NUMBER 450.01

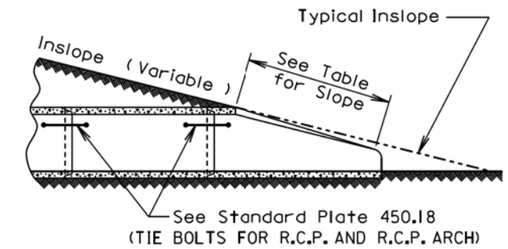
Sheet 1 of 1



TOP VIEW



LONGITUDINAL SECTION

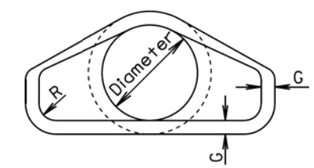


SLOPE DETAIL

GENERAL NOTES:

Lengths of concrete pipe shown on plan sheets are between flared ends only.

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



END VIEW

Dia. (in.)	Approx. Wt. of Section (lbs.)	Approx. Slope (X to Y)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	G (in.)	R (in.)
12	530	2.4:1	2	4	24	48 7/8	72 7/8	24	2	1 1/2
15	740	2.4:1	2 1/4	6	27	46	73	30	2 1/4	1 1/2
18	990	2.3:1	2 1/2	9	27	46	73	36	2 1/2	1 1/2
21	1280	2.4:1	2 3/4	9	36	37 1/2	73 1/2	42	2 3/4	1 1/2
24	1520	2.5:1	3	9 1/2	43 1/2	30	73 1/2	48	3	1 1/2
27	1930	2.5:1	3 1/4	10 1/2	49 1/2	24	73 1/2	54	3 1/4	1 1/2
30	2190	2.5:1	3 1/2	12	54	19 3/4	73 3/4	60	3 1/2	1 1/2
36	4100	2.5:1	4	15	63	34 3/4	97 3/4	72	4	1 1/2
42	5380	2.5:1	4 1/2	21	63	35	98	78	4 1/2	1 1/2
48	6550	2.5:1	5	24	72	26	98	84	5	1 1/2
54	8240	2:1	5 1/2	27	65	33 1/4	98 1/4	90	5 1/2	1 1/2
60	8730	1.9:1	6	35	60	39	99	96	5	1 1/2
66	10710	1.7:1	6 1/2	30	72	27	99	102	5 1/2	1 1/2
72	12520	1.8:1	7	36	78	21	99	108	6	1 1/2
78	14770	1.8:1	7 1/2	36	90	21	111	114	6 1/2	1 1/2
84	18160	1.6:1	8	36	90 1/2	21	111 1/2	120	6 1/2	1 1/2
90	20900	1.5:1	8 1/2	41	87 1/2	24	111 1/2	132	6 1/2	6

June 26, 2015

Published Date: 4th Qtr. 2015

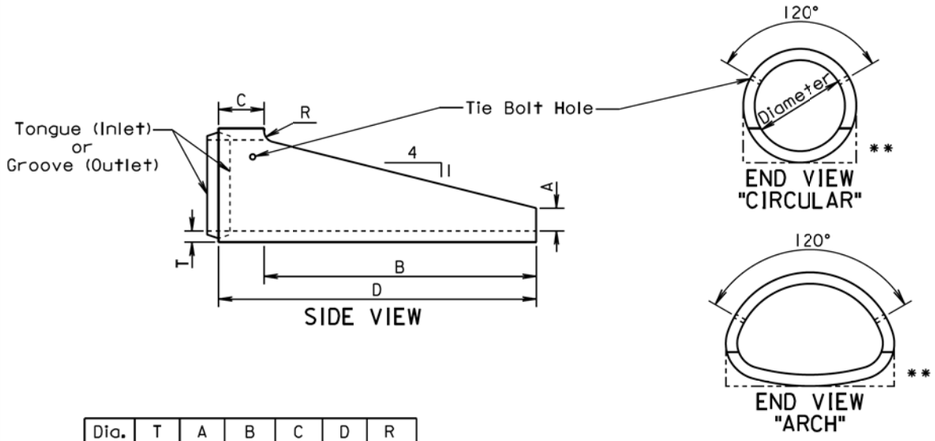
SDDOT

R. C. P. FLARED ENDS

PLATE NUMBER 450.10

Sheet 1 of 1

PLOT SCALE - 1:200
PLOTTED FROM - TRAB12222
PLOT NAME - 4
FILE - ...\04JG_450.01_450.10.DGN



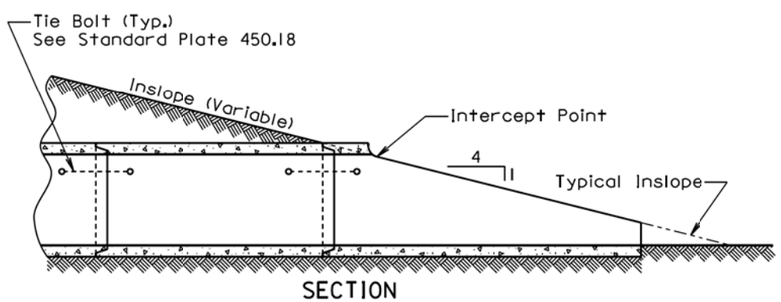
Dia. (in.)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	R (in.)
FOR CIRCULAR PIPE						
24	3	6	72	12	84	3
30	3½	7½	90	12	102	3½
FOR ARCH PIPE						
* 24	3	6	48	12	60	3
* 30	3½	7½	60	12	72	3½
* 36	4½	8⅝	66	30	96	0
* 42	4½	10	77¼	18¾	96	0

ALTERNATE

Dia. (in.)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	R (in.)
FOR CIRCULAR PIPE						
24	3	9	72	12	84	0
30	3½	11	90	12	102	0
FOR ARCH PIPE						
* 24	3	9	48	12	60	0
* 30	3½	11	60	12	72	0

* Equivalent Diameter of Circular R.C.P.

** Acceptable Flat Bottom Alternate.



SECTION
(Along Centerline of Pipe)

GENERAL NOTE:

The length of concrete pipe shown in the construction plans is between sloped ends.

September 22, 2006

Published Date: 4th Qtr. 2015

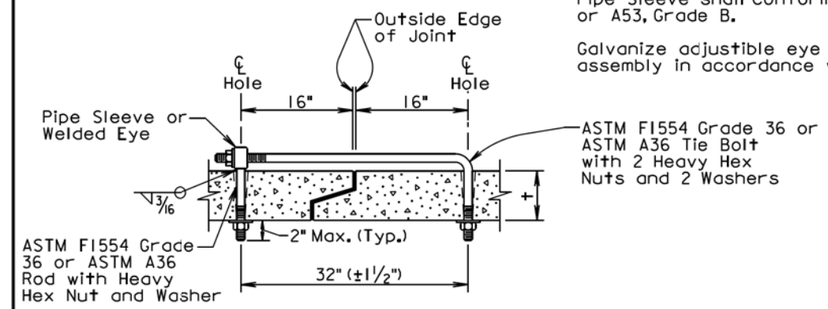
SDDOT

R. C. P. SLOPED ENDS

PLATE NUMBER 450.13

Sheet 1 of 1

Wall "t" (in.)	Rod Dia. (in.)	Pipe Sleeve Dia. (nominal)
≤ 3¼	⅝	¾
3½-6½	¾	1
≥ 7	1	1¼



ADJUSTABLE EYE BOLT TIE

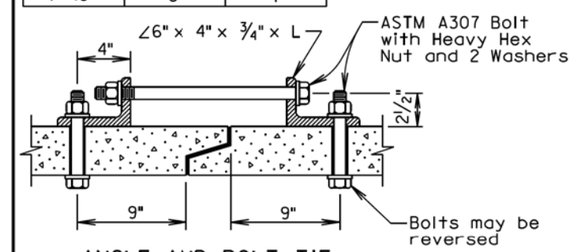
GENERAL NOTES:

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 adjustible eye bolt tie assembly in accordance with ASTM A153.

Pipe Dia. (in.)	"L" (in.)	Bolt Dia. (in.)
≤ 48	4	¾
> 48	6	1



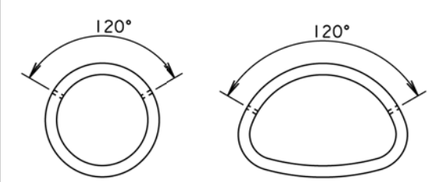
ANGLE AND BOLT TIE

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.



END VIEW
"CIRCULAR"

END VIEW
"ARCH"

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.

February 28, 2013

Published Date: 4th Qtr. 2015

SDDOT

TIE BOLTS FOR R.C.P. AND R.C.P. ARCH

PLATE NUMBER 450.18

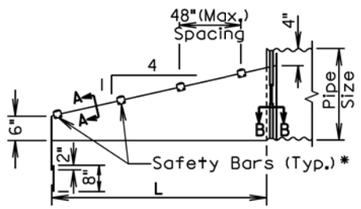
Sheet 1 of 1

PLOT SCALE - 1:200

PLOTTED FROM - TRAB12222

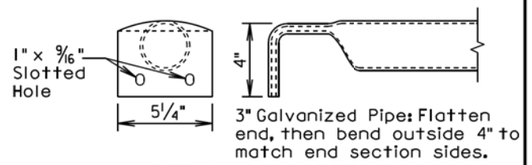
PLOT NAME - 5

FILE - ...\04J6_450.13_450.18.DGN

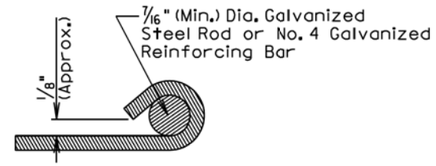


ELEVATION VIEW

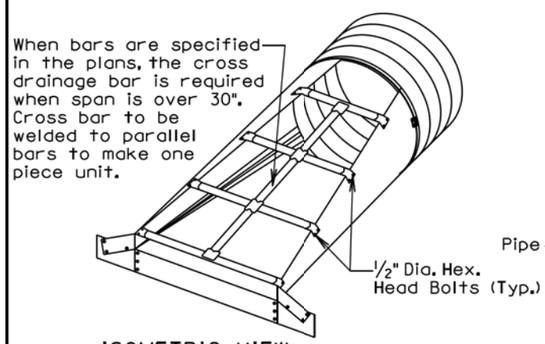
*Number of bars required will vary depending on the length of the end section.



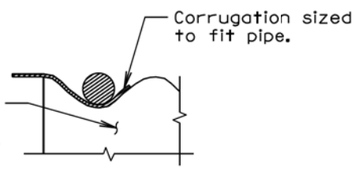
DETAIL OF SAFETY BARS



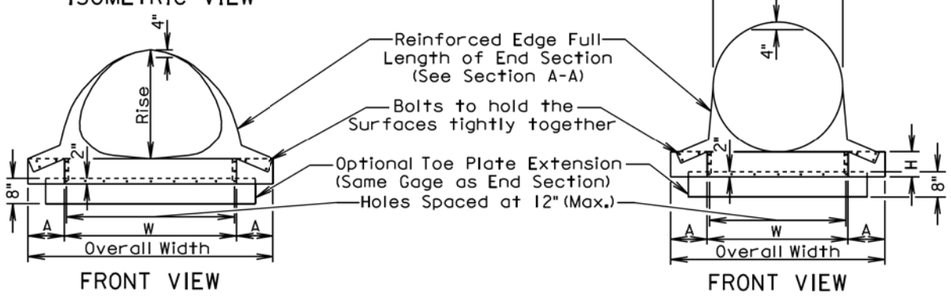
SECTION A-A



ISOMETRIC VIEW

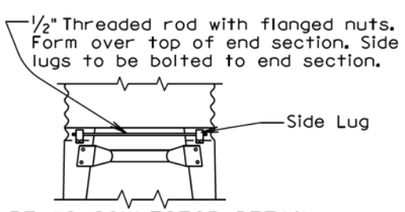


SECTION B-B

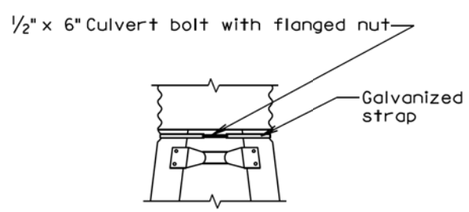


FRONT VIEW

FRONT VIEW



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



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

February 10, 2014

Published Date: 4th Qtr. 2015	SDDOT	C. M. P. SLOPED ENDS	PLATE NUMBER 450.37
			Sheet 1 of 2

ARCH C.M.P. SLOPED ENDS										
Equv. Dia. (Inch)	(Inches)		Min. Thick.		Dimensions (Inches)				L Dimensions	
	Span	Rise	Inch	Gage	A	H	W	Overall Width	Slope	Length (Inch)
18	21	15	.064	16	8	6	27	43	4:1	20
21	24	18	.064	16	8	6	30	46	4:1	32
24	28	20	.064	16	8	6	34	50	4:1	40
30	35	24	.079	14	12	9	41	65	4:1	56
36	42	29	.109	12	12	9	48	72	4:1	76
42	49	33	.109	12	16	12	55	87	4:1	92
48	57	38	.109	12	16	12	63	95	4:1	112
54	64	43	.109	12	16	12	70	102	4:1	132
60	71	47	.109	12	16	12	77	109	4:1	148
72	83	57	.109	12	16	12	89	121	4:1	188

CIRCULAR C.M.P. SLOPED ENDS								
Pipe Dia. (Inch)	Min. Thick.		Dimensions (Inches)				L Dimensions	
	Inch	Gage	A	H	W	Overall Width	Slope	Length (Inch)
15	.064	16	8	6	21	37	4:1	20
18	.064	16	8	6	24	40	4:1	32
21	.064	16	8	6	27	43	4:1	44
24	.064	16	8	6	30	46	4:1	56
30	.109	12	12	9	36	60	4:1	80
36	.109	12	12	9	42	66	4:1	104
42	.109	12	16	12	48	80	4:1	128
48	.109	12	16	12	54	86	4:1	152
54	.109	12	16	12	60	92	4:1	176
60	.109	12	16	12	66	98	4:1	200

GENERAL NOTES:

Safety bars shall be attached to sloped ends over 30" in diameter only when specified in the plans.

Sloped ends shall be fabricated from galvanized steel and shall conform to the requirements of the Specifications.

Safety bars shall be fabricated from steel schedule 40 pipe in conformance with ASTM A53, grade B or HSS 3.5X.216 in conformance with ASTM A500, grade B.

Slotted holes for safety bar attachment shall be provided for all end sections.

Attachment to circular pipes 15" through 24" diameter shall be made with Type #1 straps. All other sizes shall be attached with Type #2 rods and lugs.

When stated in the plans, optional toe plate extension shall be punched and bolted to end section apron lip with 3/8" diameter galvanized bolts. Steel for toe plate extension shall be same gauge as end section. Dimensions shall be overall width less 6" by 8" high.

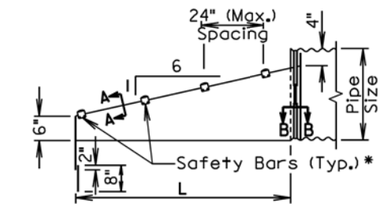
Installation shall be performed in accordance with the Specifications.

Cost of all work and materials required for fabrication and installation of sloped ends shall be incidental to the bid items for the various sizes of sloped ends.

February 10, 2014

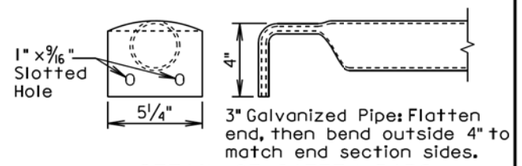
Published Date: 4th Qtr. 2015	SDDOT	C. M. P. SLOPED ENDS	PLATE NUMBER 450.37
			Sheet 2 of 2

PLOT SCALE - 1:200
PLOTTED FROM - TRAB12222
PLOT NAME - 6
FILE - ...\04JG_450.37_450.37.DGN

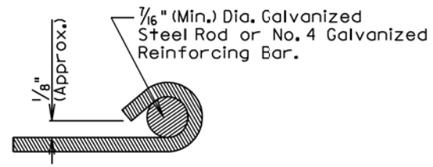


ELEVATION VIEW

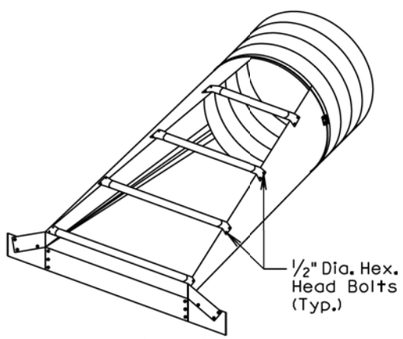
* Number of bars required will vary depending on the length of the end section.



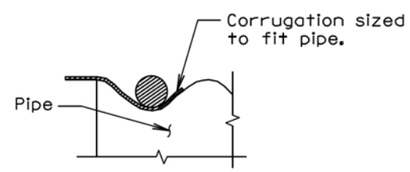
DETAIL OF SAFETY BARS



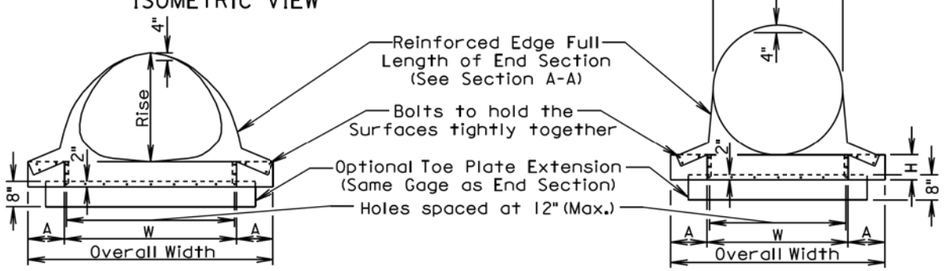
SECTION A-A



ISOMETRIC VIEW

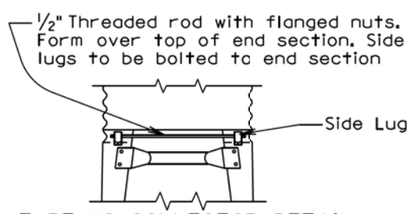


SECTION B-B

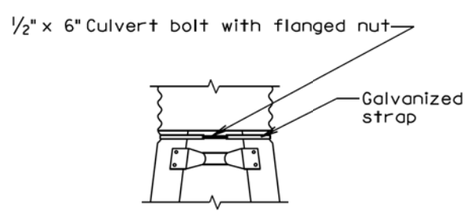


FRONT VIEW

FRONT VIEW



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



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

June 26, 2015

Published Date: 4th Qtr. 2015	SDDOT	C. M. P. SAFETY ENDS	PLATE NUMBER 450.38
			Sheet 1 of 2

ARCH C.M.P. SAFETY ENDS

Equv. Dia. (Inch)	(Inches) Span	Rise	Min. Thick. Inch	Gage	Dimensions (Inches) A	H	W	Overall Width	L Dimensions Slope	Length (Inch)
18	21	15	.064	16	8	6	27	43	6:1	30
21	24	18	.064	16	8	6	30	46	6:1	48
24	28	20	.064	16	8	6	34	50	6:1	60
30	35	24	.079	14	12	9	41	65	6:1	84
36	42	29	.109	12	12	9	48	72	6:1	114
42	49	33	.109	12	16	12	55	87	6:1	138
48	57	38	.109	12	16	12	63	95	6:1	168
54	64	43	.109	12	16	12	70	102	6:1	198
60	71	47	.109	12	16	12	77	109	6:1	222
72	83	57	.109	12	16	12	89	121	6:1	282

CIRCULAR C.M.P. SAFETY ENDS

Pipe Dia. (Inch)	Min. Thick. Inch	Gage	Dimensions (Inches) A	H	W	Overall Width	L Dimensions Slope	Length (Inch)
15	.064	16	8	6	21	37	6:1	30
18	.064	16	8	6	24	40	6:1	48
21	.064	16	8	6	27	43	6:1	66
24	.064	16	8	6	30	46	6:1	84
30	.109	12	12	9	36	60	6:1	120
36	.109	12	12	9	42	66	6:1	156
42	.109	12	16	12	48	80	6:1	192
48	.109	12	16	12	54	86	6:1	228
54	.109	12	16	12	60	92	6:1	264
60	.109	12	16	12	66	98	6:1	300

GENERAL NOTES:

Safety ends shall be fabricated from galvanized steel conforming to the requirements of the Specifications.

Safety bars shall be fabricated from steel schedule 40 pipe in conformance with ASTM A53, grade B or HSS 3.5X.216 in conformance with ASTM A500, grade B.

Slotted holes for safety bar attachment shall be provided for all end sections.

Attachment to circular pipes 15" through 24" diameter shall be made with Type #1 straps. All other sizes shall be attached with Type #2 rods and lugs.

When stated in the plans, optional toe plate extension shall be punched and bolted to end section apron lip with 3/8" diameter galvanized bolts. Steel for toe plate extension shall be same gauge cs end section. Dimensions shall be overall width less 6" by 8" high.

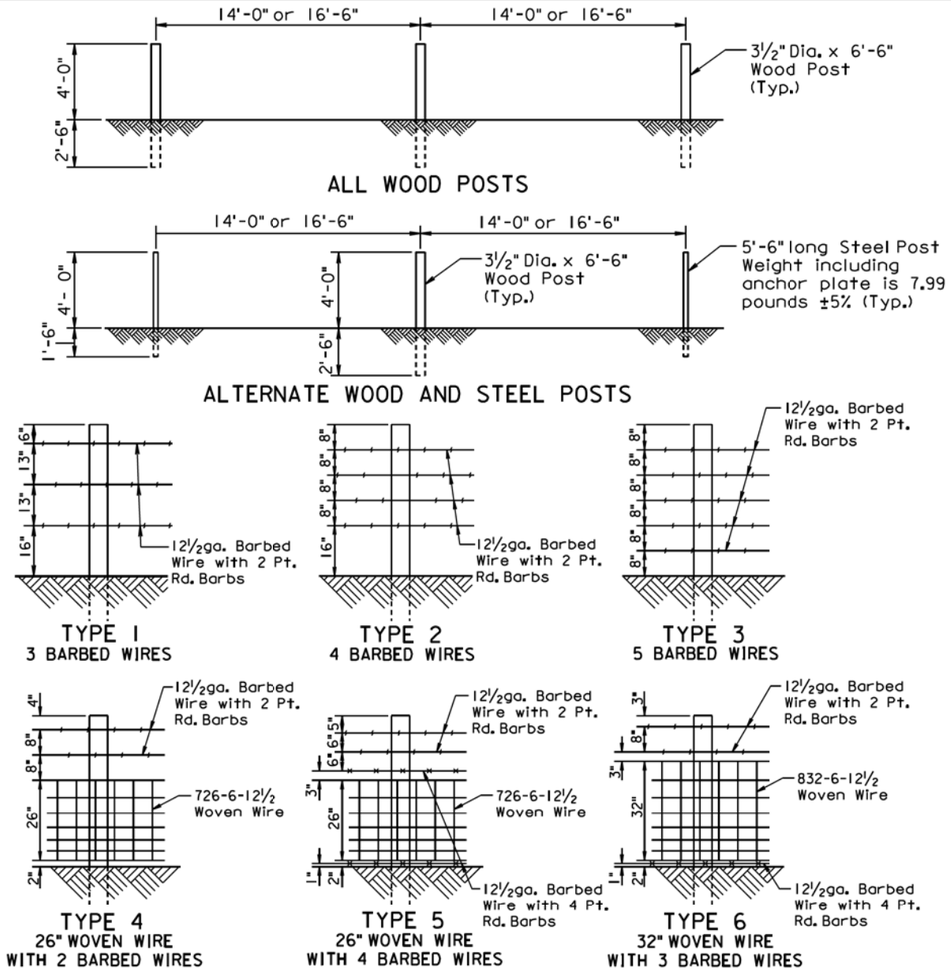
Installation shall be performed in accordance with the Specifications.

Cost of all work and materials required for fabrication and installation of safety ends shall be incidental to the bid items for the various sizes of safety ends.

June 26, 2015

Published Date: 4th Qtr. 2015	SDDOT	C. M. P. SAFETY ENDS	PLATE NUMBER 450.38
			Sheet 2 of 2

PLOT SCALE - 1:200
PLOTTED FROM - TRAB12222
PLOT NAME - 7
FILE - ...\04J6_450.38_450.38.DGN



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

GENERAL NOTES:

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

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

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

September 14, 2009

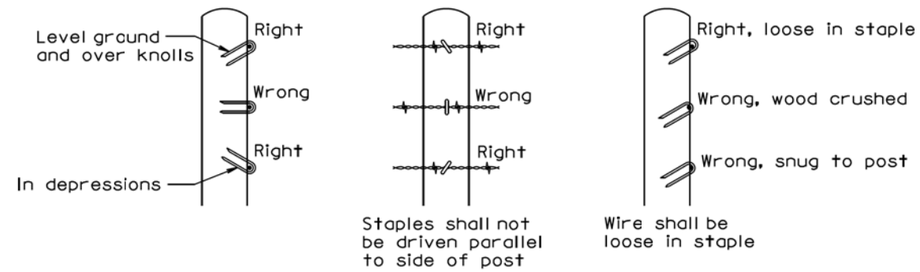
Published Date: 4th Qtr. 2015

SDDOT

RIGHT-OF-WAY FENCE

PLATE NUMBER 620.01

Sheet 1 of 1



STAPLE INSTALLATION

GENERAL NOTES:

The Right-of-Way fence shall consist of barbed wire or a combination of woven wire and barbed wire. The barbed wire and/or woven wire shall be fastened to all wood posts or fastened to alternating wood and steel posts. Only wood posts shall be used for brace panels. Gates shall be of the type designated in the plans or as otherwise directed by the Engineer. Fence shall 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 shall 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 shall 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 shall be fabricated from zinc coated 14 ga. wire. Two point barbs shall be wrapped twice around one main strand at 4" spacings and the four point barbs shall be interlocked and wrapped around both main strands at 5" 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 shall be as stated in AASHTO M281. Woven wire shall conform to design and specifications of ASTM A116 and barbed wire shall conform to ASTM A121.

December 23, 2004

Published Date: 4th Qtr. 2015

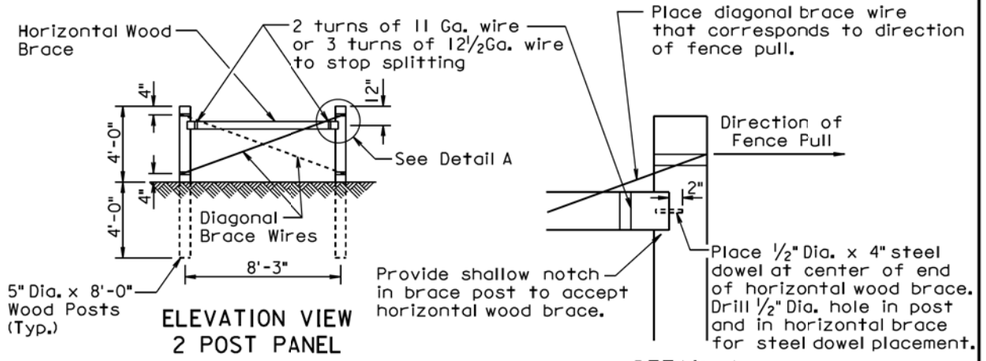
SDDOT

STAPLE INSTALLATION AND GENERAL RIGHT-OF-WAY FENCE NOTES

PLATE NUMBER 620.02

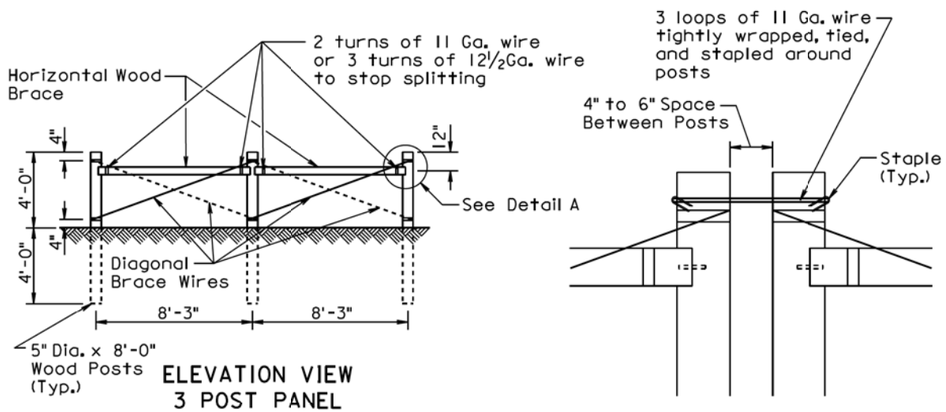
Sheet 1 of 1

PLOT SCALE - 1:200
PLOTTED FROM - TRAB12222
PLOT NAME - 8
FILE - ...\04J6_620.01_620.02.DGN



ELEVATION VIEW
2 POST PANEL

DETAIL A



ELEVATION VIEW
3 POST PANEL

DETAIL B

GENERAL NOTES:

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

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

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

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

December 23, 2004

Published Date: 4th Qtr. 2015	SDDOT	BRACE PANELS AND APPLICATIONS OF BRACE PANELS	PLATE NUMBER 620.03
			Sheet 1 of 3

SPACING OF 2 POST PANELS WITHIN CURVES	
DEGREE OF CURVE	SPACING OF 2 POST PANEL
less than 3°15'	** 1320'
3°15' and greater	**At P.C., P.T., and at every 1320' between P.C. and P.T.

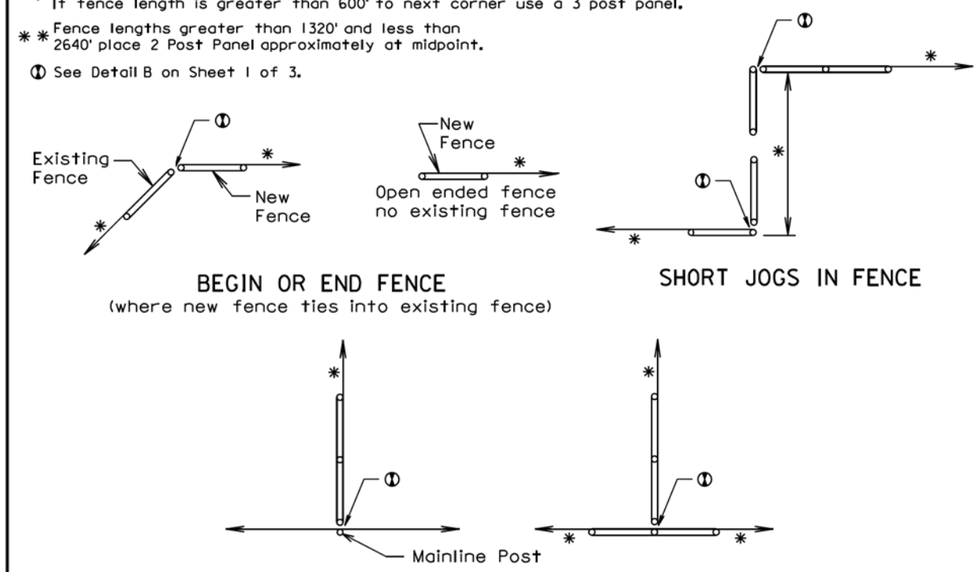
GENERAL NOTE:

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.

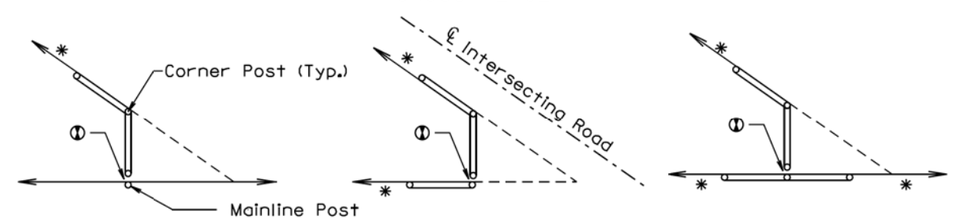
① See Detail B on Sheet 1 of 3.



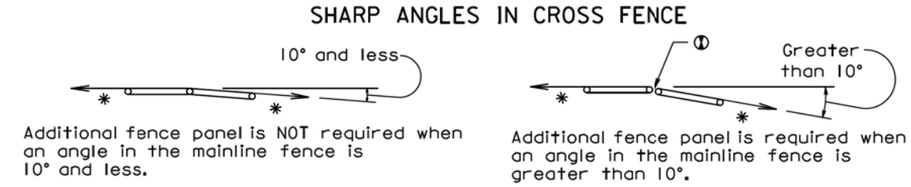
BEGIN OR END FENCE
(where new fence ties into existing fence)

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.

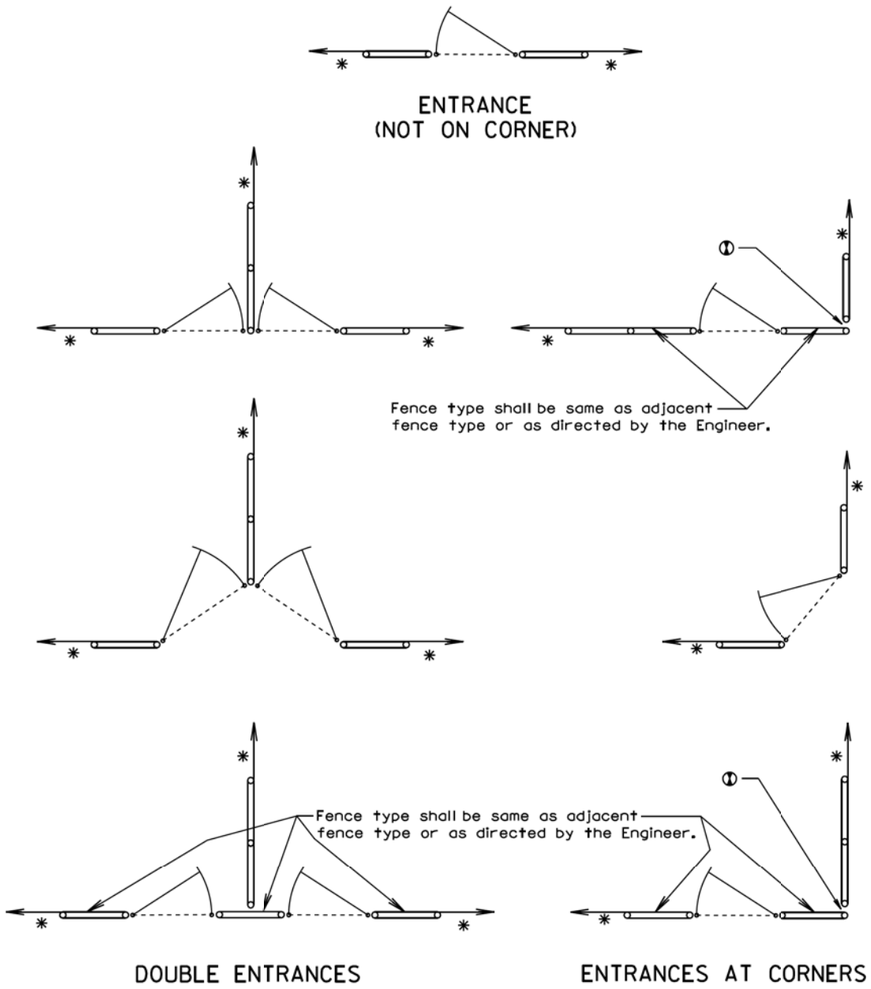
Additional fence panel is required when an angle in the mainline fence is greater than 10°.

ANGLES IN MAINLINE FENCE

December 23, 2004

Published Date: 4th Qtr. 2015	SDDOT	BRACE PANELS AND APPLICATIONS OF BRACE PANELS	PLATE NUMBER 620.03
			Sheet 2 of 3

PLOT SCALE - 1:200
PLOTTED FROM - TRAB12222
PLOT NAME - 9
FILE - ...\04J6_620.03_620.03.DGN



GATES

* 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.

① See Detail B on Sheet 1 of 3.

December 23, 2004

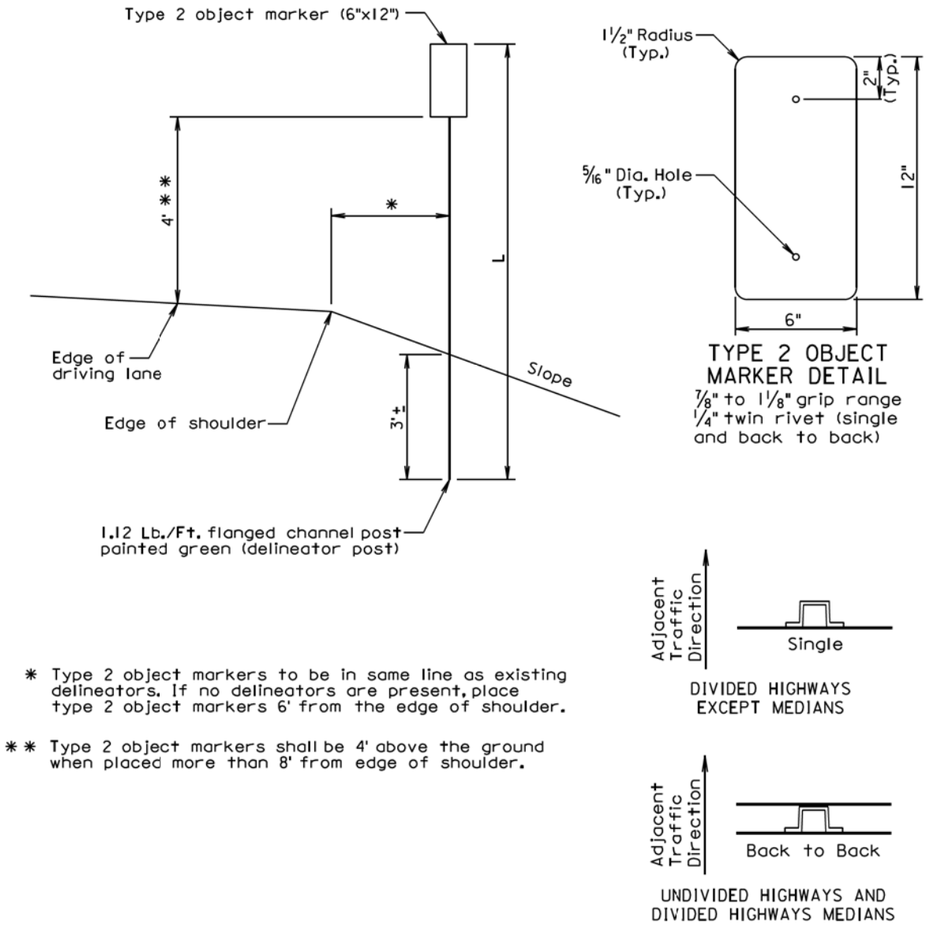
Published Date: 4th Qtr. 2015

SDDOT

BRACE PANELS AND APPLICATIONS OF BRACE PANELS

PLATE NUMBER 620.03

Sheet 3 of 3



TYPE 2 OBJECT MARKER DETAIL

7/8" to 1 1/8" grip range
1/4" twin rivet (single and back to back)

* Type 2 object markers to be in same line as existing delineators. If no delineators are present, place type 2 object markers 6' from the edge of shoulder.

** Type 2 object markers shall be 4' above the ground when placed more than 8' from edge of shoulder.

DIVIDED HIGHWAYS EXCEPT MEDIANS

UNDIVIDED HIGHWAYS AND DIVIDED HIGHWAYS MEDIANS

TYPE 2 OBJECT MARKER DETAILS AND POST ORIENTATION

Distance To Marker (Ft.) *		2	3	4	5	6	7	8
		Post Length L (Ft.)						
Slope	4:1	9	9	9	9	10	10	10
	3:1	9	9	9	10	10	10	11

June 26, 2006

Published Date: 4th Qtr. 2015

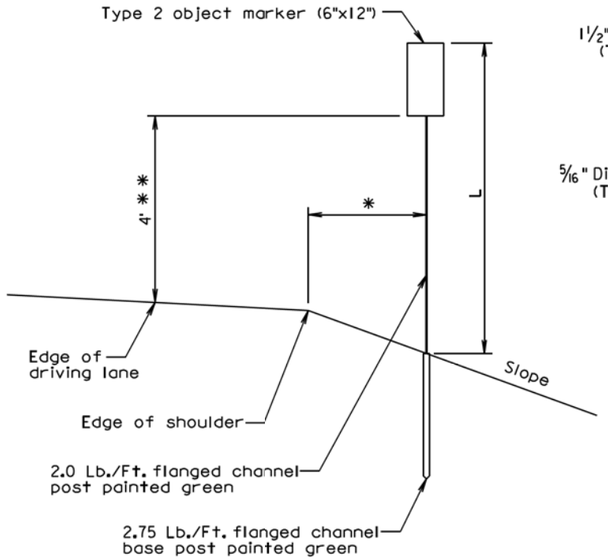
SDDOT

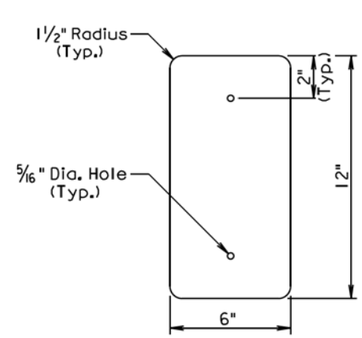
TYPE 2 OBJECT MARKER (DIRECT DRIVE)

PLATE NUMBER 632.01

Sheet 1 of 1

PLOT SCALE - 1:200
PLOTTED FROM - TRAB12222
PLOT NAME - 10
FILE - ...\04J6_620.03_632.01.DGN



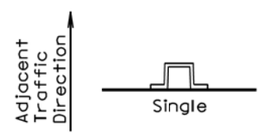


TYPE 2 OBJECT MARKER DETAIL

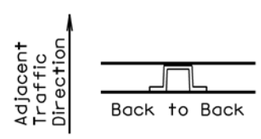
⅞" to 1⅛" grip range
¼" twin rivet (single and back to back)

* Type 2 object markers to be in same line as existing delineators. If no delineators are present, place type 2 object markers 6' from the edge of shoulder.

** Type 2 object markers shall be 4' above the ground when placed more than 8' from edge of shoulder.



DIVIDED HIGHWAYS EXCEPT MEDIANS



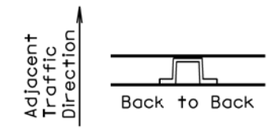
UNDIVIDED HIGHWAYS AND DIVIDED HIGHWAYS MEDIANS

TYPE 2 OBJECT MARKER DETAILS AND POST ORIENTATION

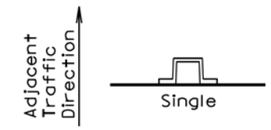
Distance To Marker (Ft.) *		2	3	4	5	6	7	8
		Post Length L (Ft.)						
Slope	4:1	6	6	6	6	7	7	7
	3:1	6	6	6	7	7	7	8

June 26, 2006

Published Date: 4th Qtr. 2015	SDDOT	TYPE 2 OBJECT MARKER (BREAKAWAY SIGN SUPPORT)	PLATE NUMBER 632.02
			Sheet 1 of 1

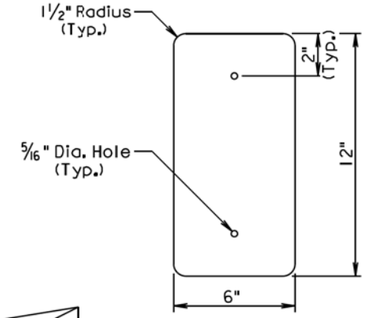


UNDIVIDED HIGHWAYS AND DIVIDED HIGHWAYS MEDIANS



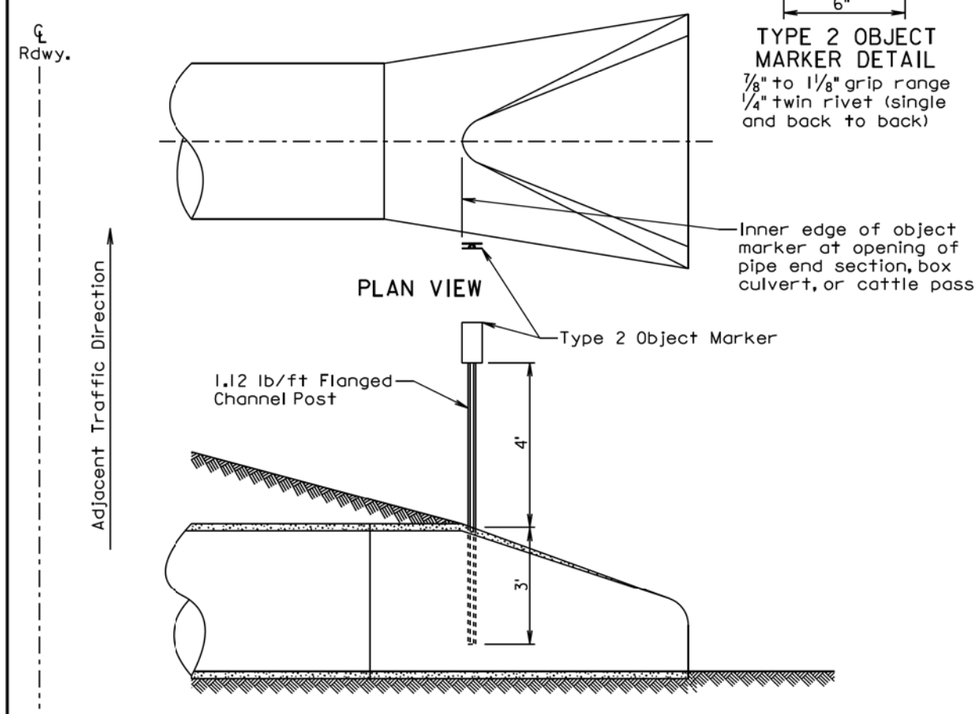
DIVIDED HIGHWAYS EXCEPT MEDIANS

TYPE 2 OBJECT MARKER DETAILS AND POST ORIENTATION



TYPE 2 OBJECT MARKER DETAIL

⅞" to 1⅛" grip range
¼" twin rivet (single and back to back)



PLAN VIEW

ELEVATION

GENERAL NOTES:

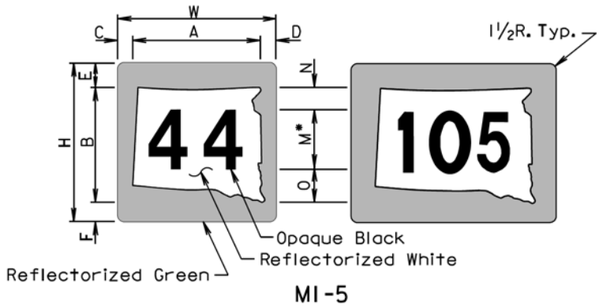
The type 2 object markers and the 1.12 lb/ft flanged channel posts shall be in conformance with Specifications Section 982.2 J.

Payment for the type 2 object markers shall be in conformance with Specification Section 632.5 B.

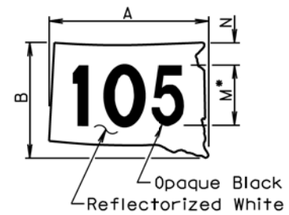
June 26, 2015

Published Date: 4th Qtr. 2015	SDDOT	TYPE 2 OBJECT MARKER INSTALLATION AT PIPE CULVERTS, BOX CULVERTS, AND CATTLE PASSES	PLATE NUMBER 632.10
			Sheet 1 of 1

PLOT SCALE - 1:200
PLOTTED FROM - TRAB12222
PLOT NAME - 11
FILE - ...\04J6_632.02_632.10.DGN



MI-5



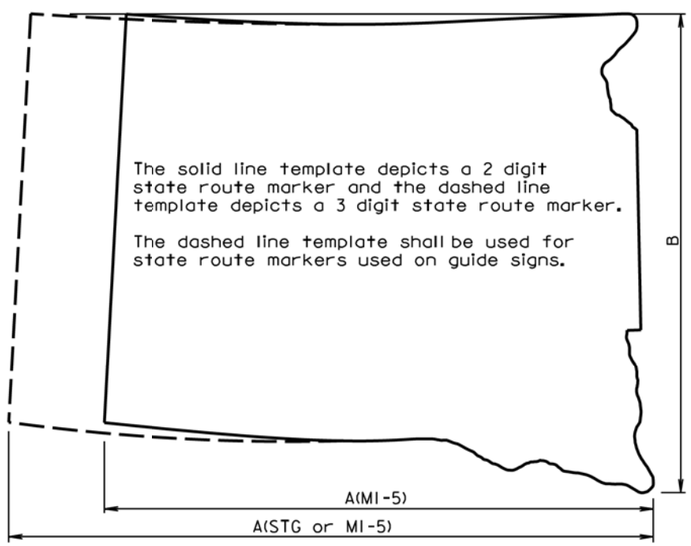
STG

SIGN CODE	WxH	A	B	C	D	E	F	M*	N	O
MI-5	24x24	20½	18	2	1½	3½	2½	12D	2	4
MI-5**	30x24	24	18	2¼	1¾	3½	2½	12D	2	4
MI-5	30x30	25⅝	22½	2½	1⅞	4⅜	3⅛	15D	2½	5
MI-5	36x36	30¾	27	3	2¼	5¼	3¾	18D	3	6

SIGN CODE	AxB	M*	N
STG-24	24x18	10D	4
STG-32	32x24	12D	4¾
STG-48	48x36	18D	7
STG-64	64x48	24D	9½

*In the few cases where there is not enough space for the numerals, the standard "D" series font may be replaced with "C" series font if approved by the Engineer.

**3 Digits



TEMPLATE FOR STATE ROUTE MARKER

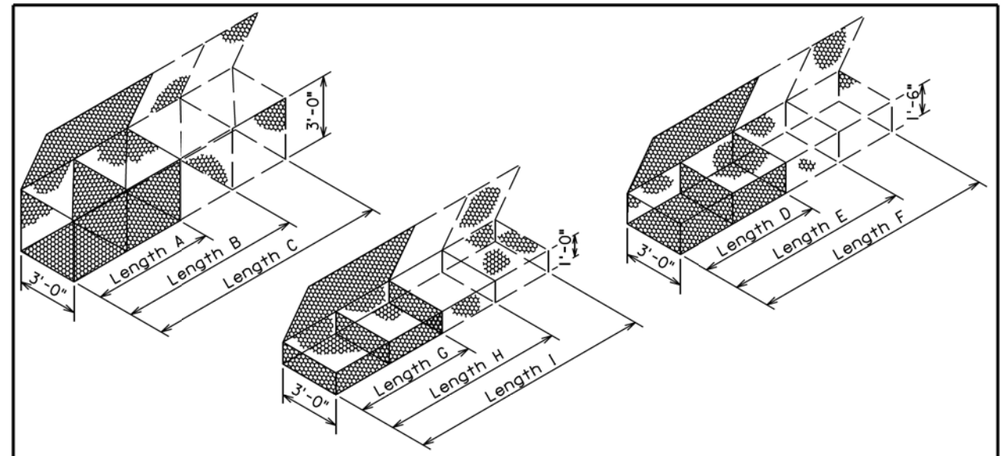
GENERAL NOTES:

The unit for all dimensions shown is inches.

Numerals shall be "D" series font for all state route markers except as noted above.

December 23, 2003

Published Date: 4th Qtr. 2015	SDDOT	STATE ROUTE MARKERS	PLATE NUMBER 632.20 Sheet 1 of 1



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

Above Dimensions subject to mill tolerances.

GENERAL NOTES:

Lacing and internal connecting wire shall be 0.0866 inch diameter steel wire ASTM A641 Class 3 soft temper measured after galvanizing and for PVC coated gabions shall 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 1 ½ 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 shall be used for gabion assembly and final construction of gabion structures. Interlocking fasteners for galvanized gabions shall be high tensile 0.120 inch diameter galvanized steel wire measured after galvanizing. The galvanizing shall conform to ASTM A641-92 Class 3 coating. Fasteners shall also be in accordance with ASTM A764, Class II, Type III.

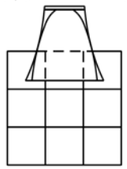
Interlocking fasteners for PVC coated gabions shall be high tensile 0.120 inch diameter stainless steel wire conforming to ASTM A313, Type 302, Class I. The spacing of the interlocking fasteners during all phases of assembly and construction shall not exceed 6 inches.
All fasteners shall be placed where the mesh weaves around the selvage wire at the vertical and horizontal joints.

June 26, 2001

Published Date: 4th Qtr. 2015	SDDOT	BANK AND CHANNEL PROTECTION GABIONS	PLATE NUMBER 720.01 Sheet 1 of 1

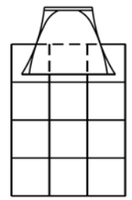
PLOT SCALE - 1:200
PLOTTED FROM - TRAB12222
PLOT NAME - 12
FILE - ...\04J6_632.20_720.01.DGN

12", 18", & 24" RCP & CMP
12", 18", & 24" RCP Arch & CMP Arch



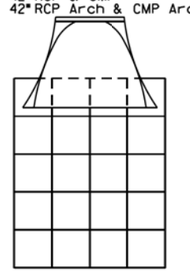
4.5 Cu. Yds.

30" & 36" RCP & CMP
30" & 36" RCP Arch & CMP Arch



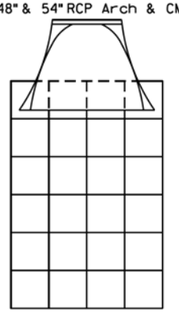
6.0 Cu. Yds.

42" RCP & CMP
42" RCP Arch & CMP Arch



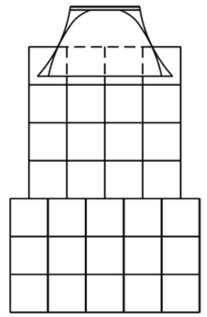
10.0 Cu. Yds.

48" & 54" RCP & CMP
48" & 54" RCP Arch & CMP Arch



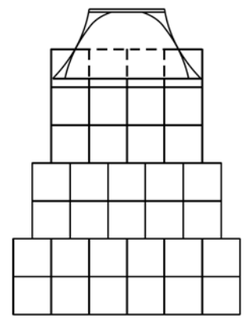
12.0 Cu. Yds.

60" RCP & CMP
60" RCP Arch & CMP Arch



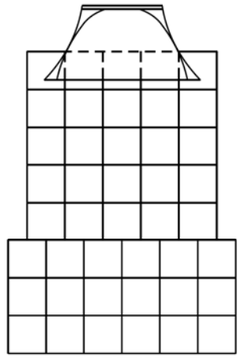
15.5 Cu. Yds.

66" RCP & CMP



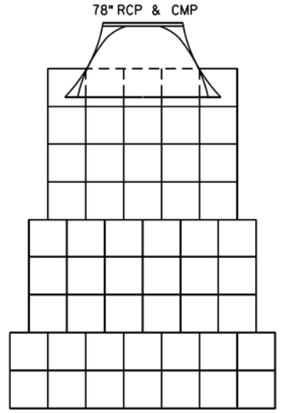
17.0 Cu. Yds.

72" RCP & CMP
72" RCP Arch & CMP Arch



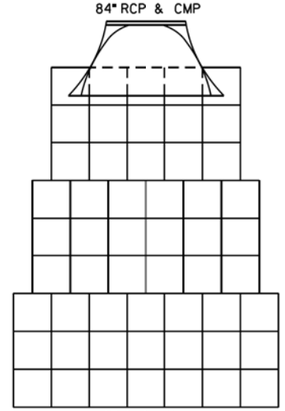
21.5 Cu. Yds.

78" RCP & CMP



26.0 Cu. Yds.

84" RCP & CMP



27.0 Cu. Yds.

GENERAL NOTES:

Gabions at outlets of C. M. pipe and R. C. pipe shall be placed under the end section a distance of 2' from the outlet end of the section. For C. M. pipe end section installations, the upper fabric of the gabions shall be modified to accommodate the metal end section in a manner approved by the Engineer.

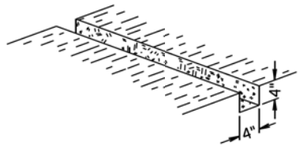
Quantities shown on this standard plate are based on standard gabion sizes D, E, and F (See Standard Plate 720.01).

June 26, 2001

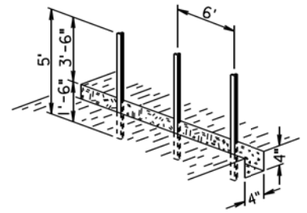
Published Date: 4th Qtr. 2015	**SDDOT**	***BANK AND CHANNEL PROTECTION GABION PLACEMENT UNDER PIPE END SECTIONS***	***PLATE NUMBER*** *720.03*
			Sheet 1 of 1

PLOT SCALE - 1:200
PLOTTED FROM - TRAB12222
PLOT NAME - 13
FILE - ...\04J6_720.03_OPEN.DGN

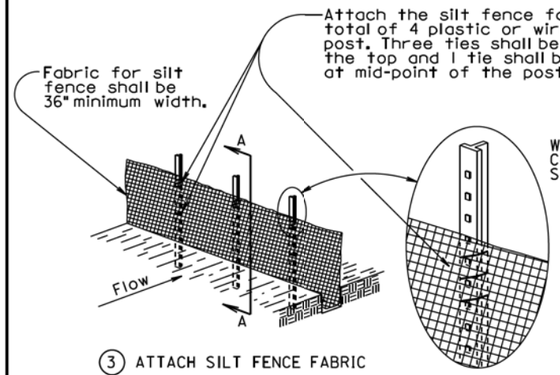
MANUAL HIGH FLOW SILT FENCE INSTALLATION



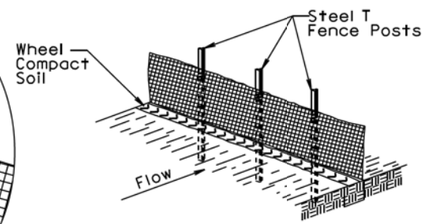
① EXCAVATE TRENCH



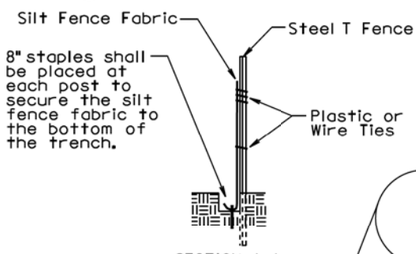
② DRIVE STEEL T FENCE POSTS



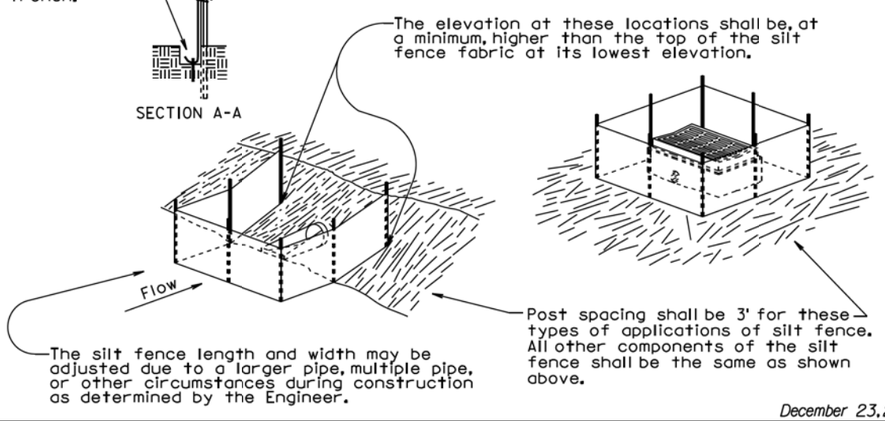
③ ATTACH SILT FENCE FABRIC



④ BACKFILL TRENCH AND WHEEL COMPACT SOIL



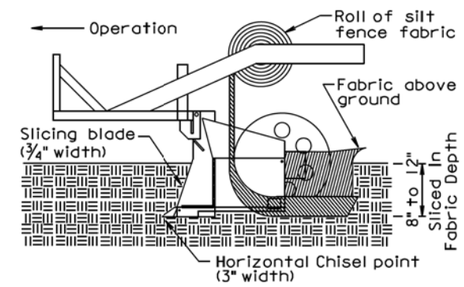
SECTION A-A



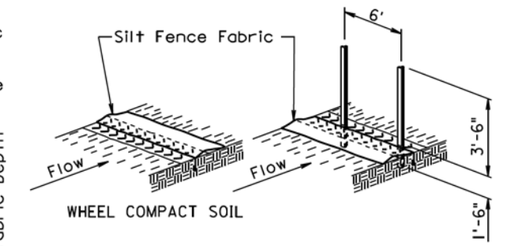
December 23, 2003

Published Date: 4th Qtr. 2015	SDDOT	HIGH FLOW SILT FENCE	PLATE NUMBER 734.05
			Sheet 1 of 2

MACHINE SLICED HIGH FLOW SILT FENCE INSTALLATION



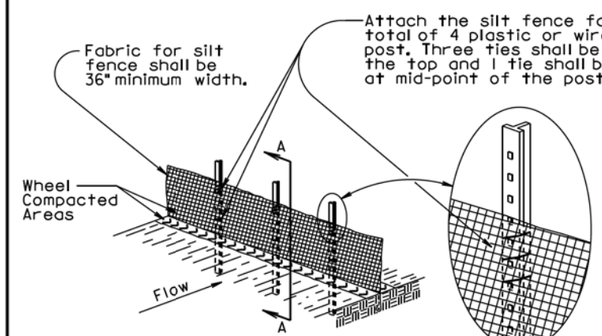
① INSTALL SILT FENCE FABRIC BY MACHINE SLICING METHOD.



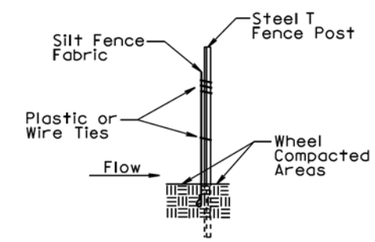
WHEEL COMPACT SOIL

DRIVE STEEL T FENCE POSTS

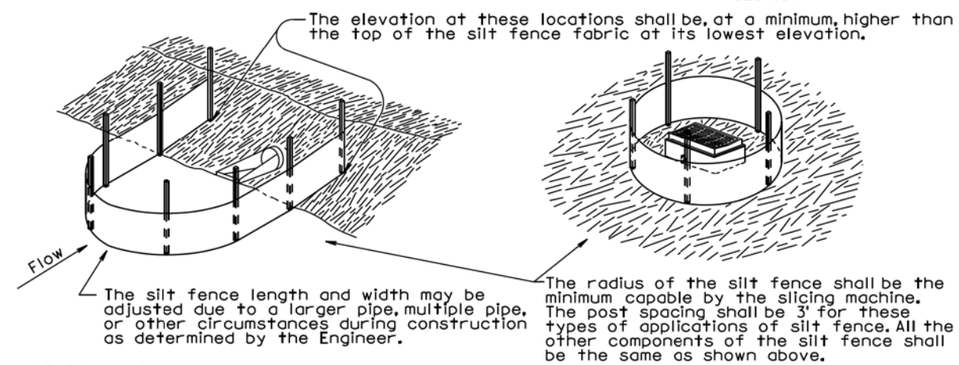
② WHEEL COMPACT SOIL ABOVE SLICED IN PORTION OF FABRIC AND THEN DRIVE STEEL T FENCE POSTS.



③ ATTACH SILT FENCE FABRIC



SECTION A-A



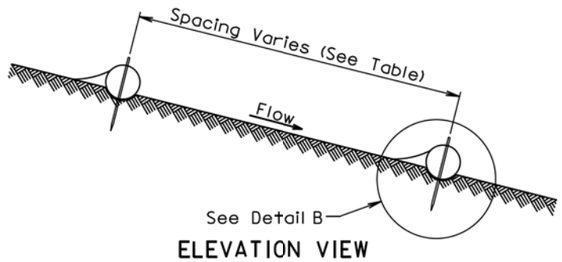
GENERAL NOTE:

If a trench can not be dug or the silt fence fabric can not be sliced in due to the type of earthen material (such as rock), then a row of 30 to 40 pound sandbags butted end to end shall be provided on top of the extra length of silt fence fabric to prevent underflow.

December 23, 2003

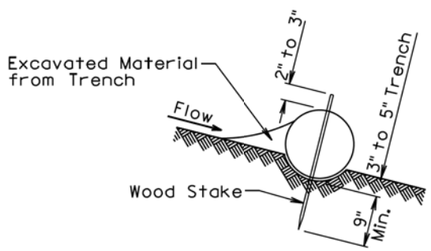
Published Date: 4th Qtr. 2015	SDDOT	HIGH FLOW SILT FENCE	PLATE NUMBER 734.05
			Sheet 2 of 2

PLOT SCALE - 1:200
PLOTTED FROM - TRAB12222
PLOT NAME - 14
FILE - ...\04J6_734.05.DGN

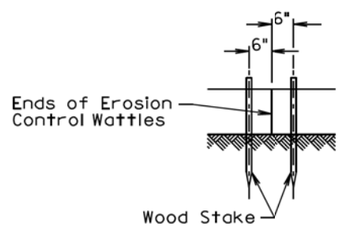


ELEVATION VIEW
CUT OR FILL SLOPE INSTALLATION

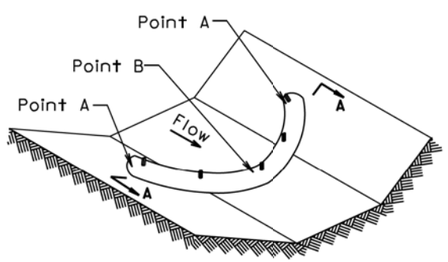
CUT OR FILL SLOPE INSTALLATION	
Slope	Spacing (Ft)
1:1	10
2:1	20
3:1	30
4:1	40



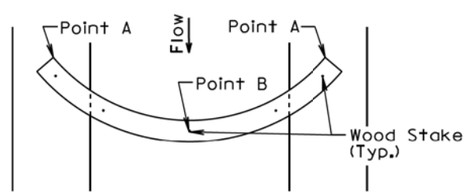
DETAIL B
(TYPICAL OF ALL INSTALLATIONS)



DETAIL C

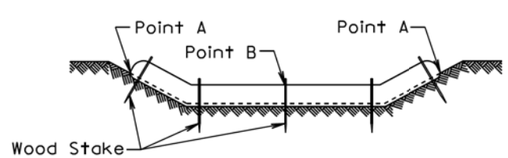


ISOMETRIC VIEW
DITCH INSTALLATION



PLAN VIEW
DITCH INSTALLATION

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



SECTION A-A

December 23, 2004

Published Date: 4th Qtr. 2015

SDDOT

EROSION CONTROL WATTLE

PLATE NUMBER 734.06

Sheet 1 of 2

GENERAL NOTES:

At cut or fill slope installations, wattles shall 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 shall 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 shall 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 shall be placed 6" from the ends of the wattles and the spacing of the stakes along the wattles shall be 3' to 4'.

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

The Contractor and Engineer shall inspect the erosion control wattles once every week and within 24 hours after every rainfall event greater than ½". The Contractor shall remove, dispose, or reshape the accumulated sediment when necessary as determined by the Engineer.

Sediment removal, disposal, or necessary shaping shall be as directed by the Engineer. All costs for removing accumulated sediment, disposal of sediment, and necessary shaping shall 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 shall be incidental to the contract unit price per foot for the corresponding erosion control wattle bid item.

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

December 23, 2004

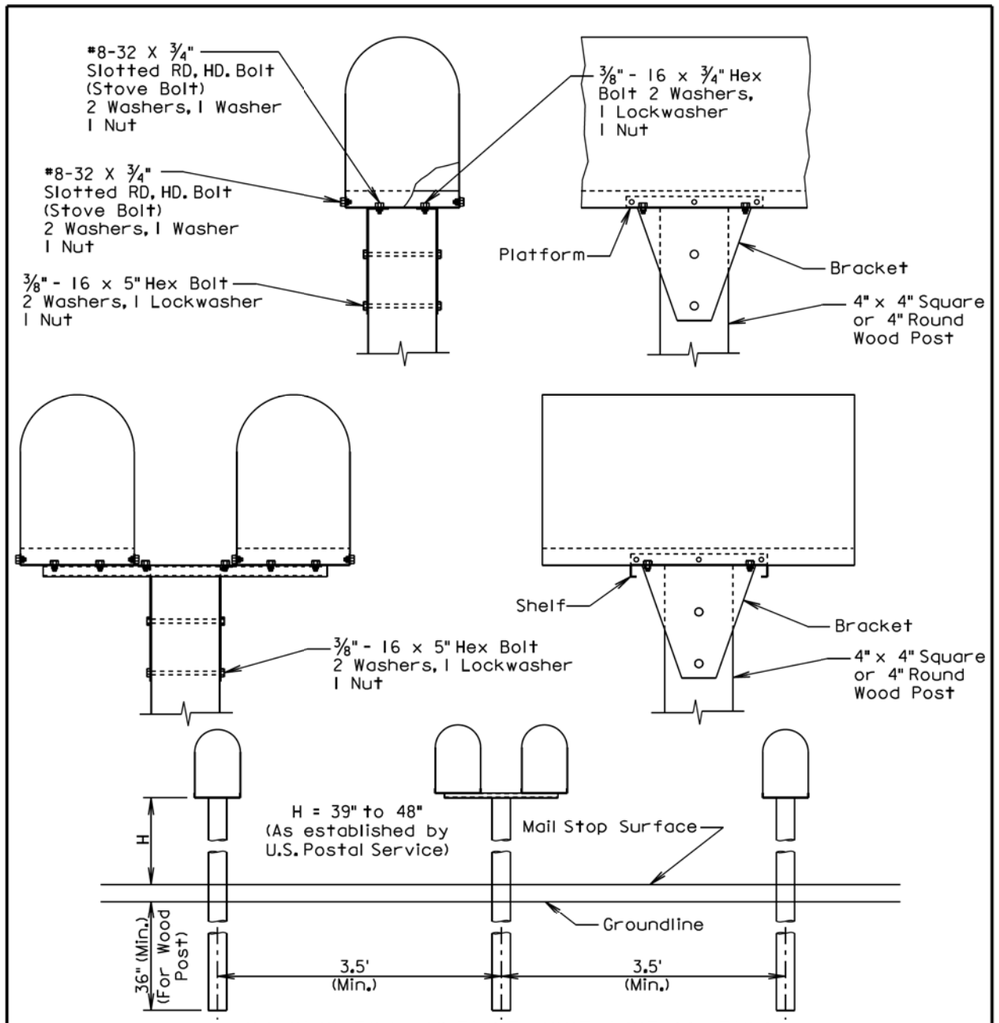
Published Date: 4th Qtr. 2015

SDDOT

EROSION CONTROL WATTLE

PLATE NUMBER 734.06

Sheet 2 of 2



SPACING FOR MULTIPLE POST INSTALLATION

GENERAL NOTES:

The post support assemblies provided should be consistant throughout the project.

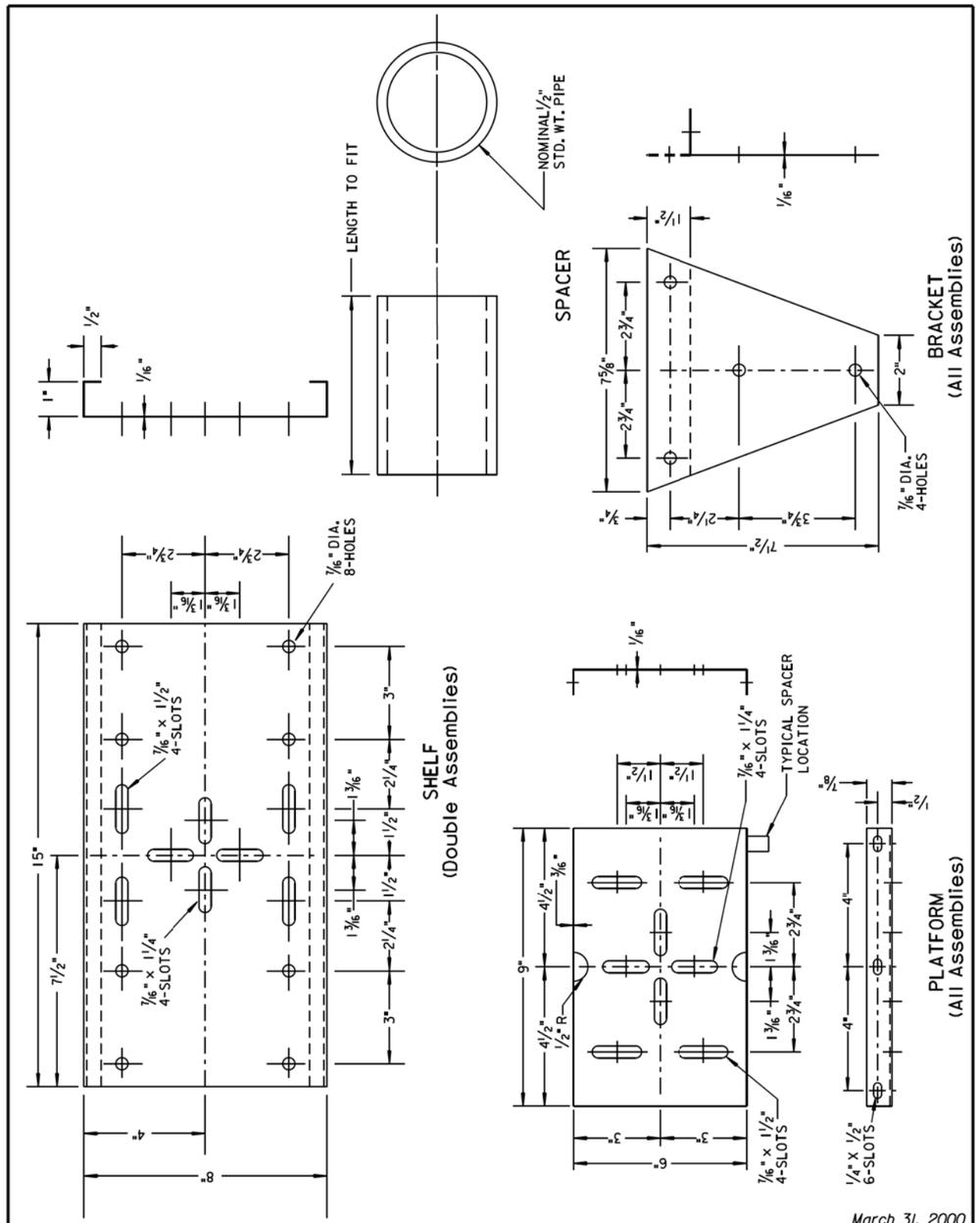
Single and double mailboxes may be in any sequence.

Post support assemblies shall be one from the approved products list, a 4"x4" or 4" round wood post, or an alternate post support assembly that meets the test level 3 crash testing requirements of NCHRP 350 or MASH.

Alternate mailbox support assemblies shall be approved by the Engineer prior to installation. The Contractor shall provide the Engineer written certification that the mailbox support assembly has met the crash testing requirements and will be installed in accordance with the manufacturer's installation instructions.

September 6, 2013

Published Date: 4th Qtr. 2015	SDDOT	SINGLE AND DOUBLE MAILBOX ASSEMBLIES	PLATE NUMBER 900.02
			Sheet 1 of 1



March 31, 2000

Published Date: 4th Qtr. 2015	SDDOT	MAILBOX SUPPORT HARDWARE	PLATE NUMBER 900.03
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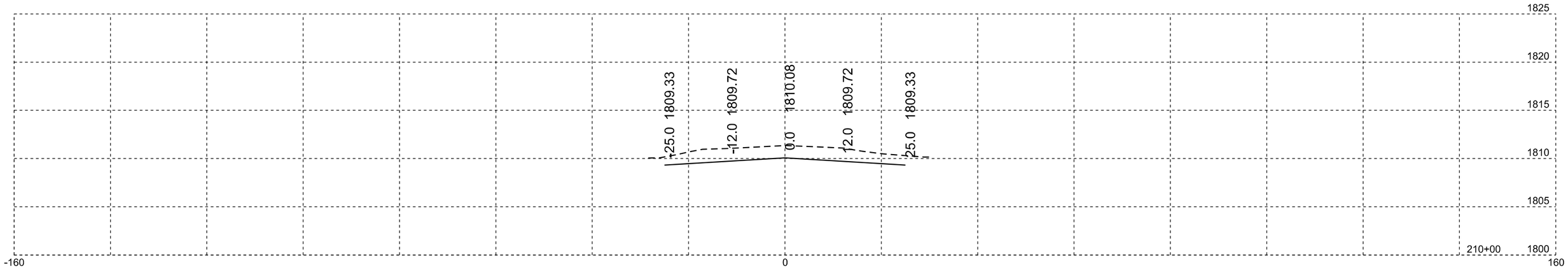
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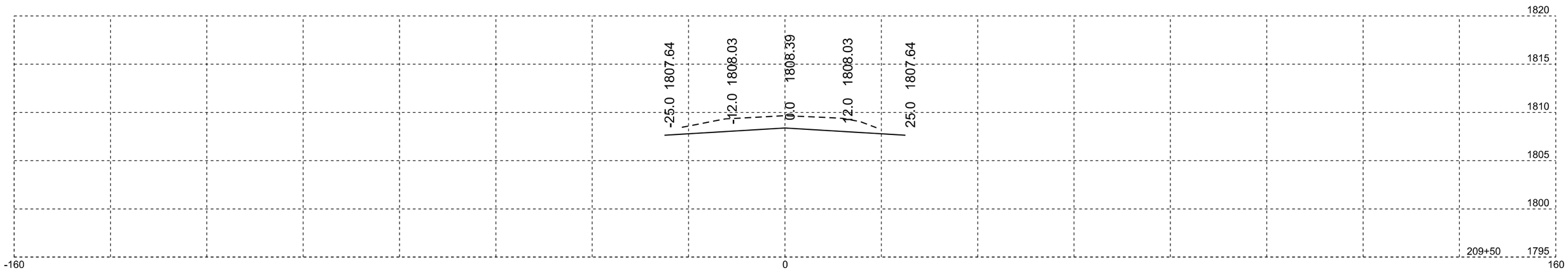
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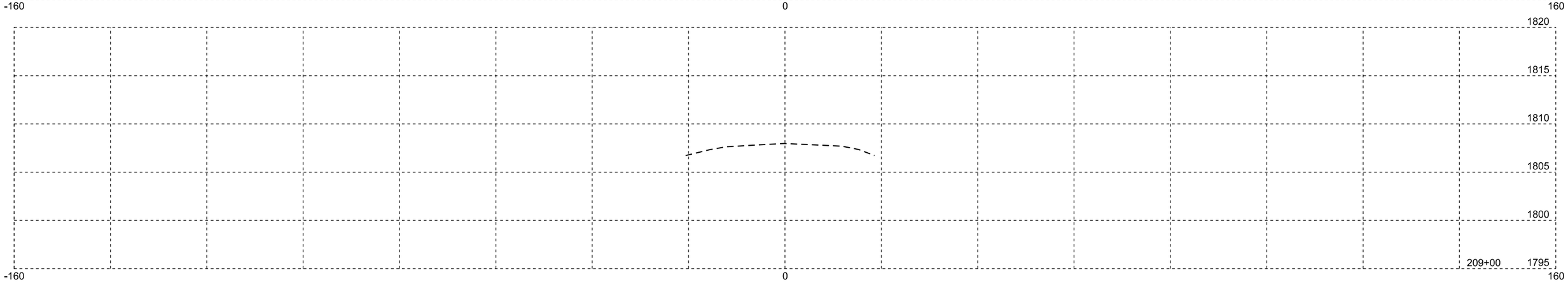
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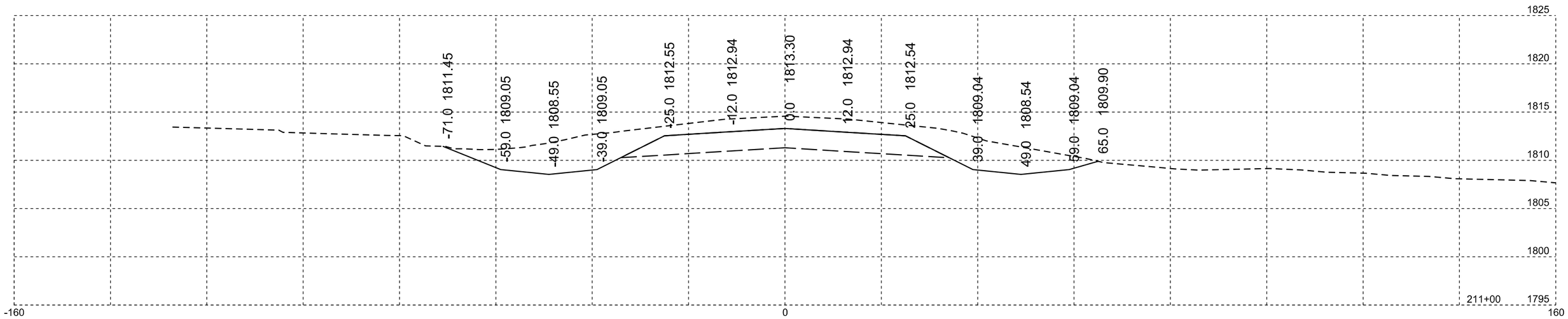
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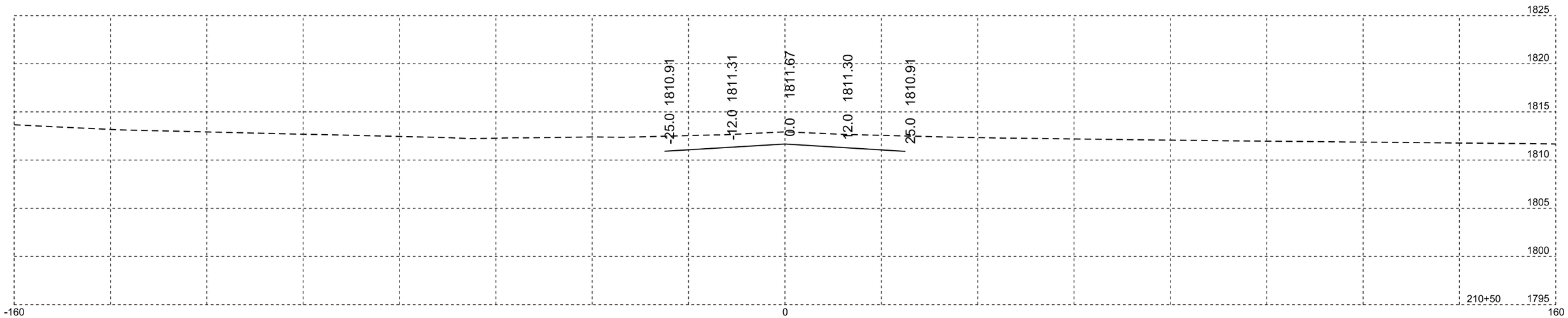
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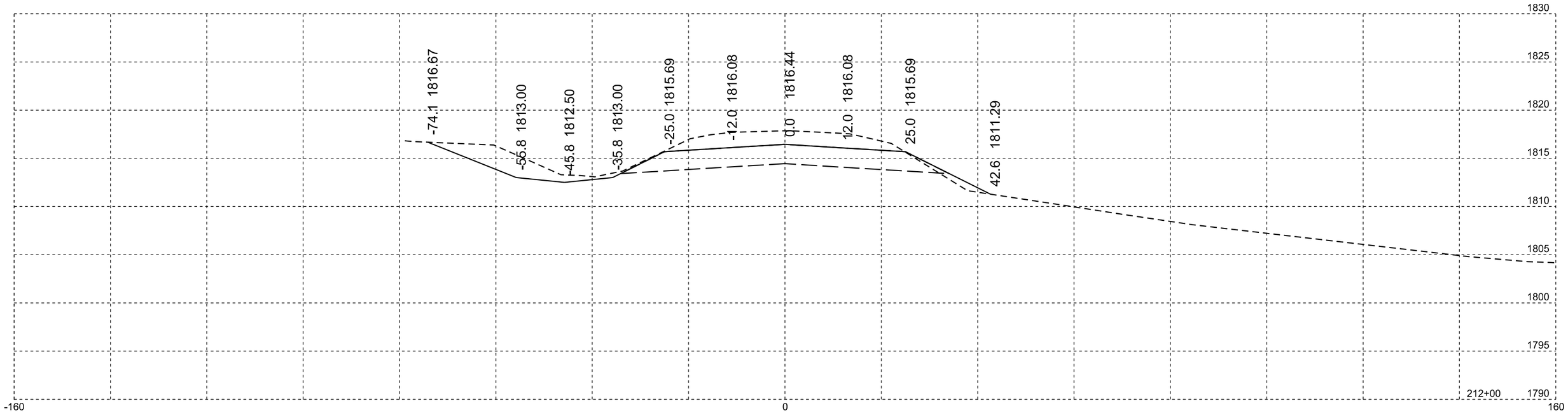
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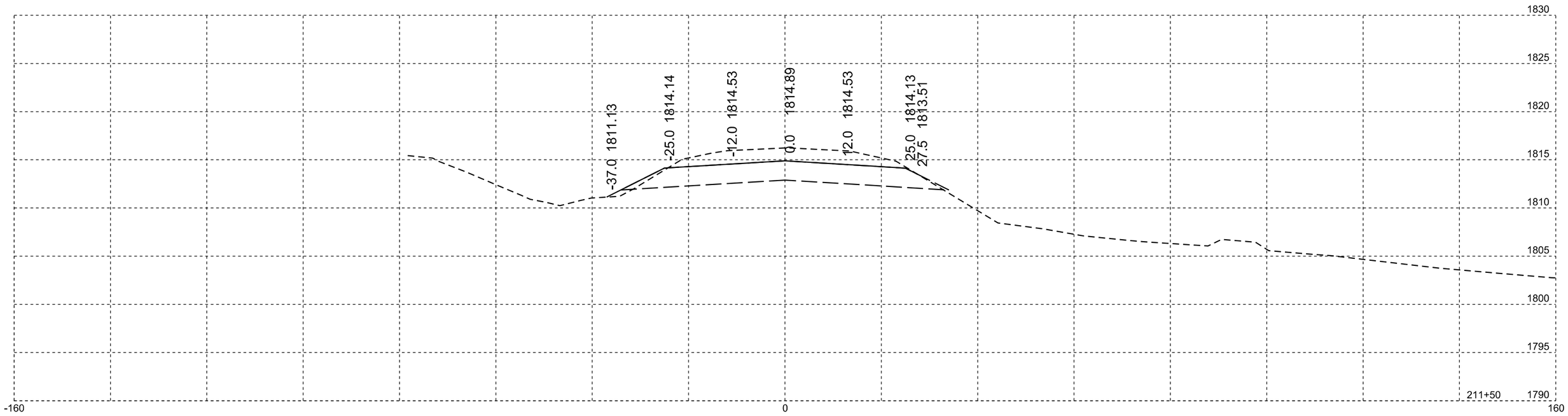
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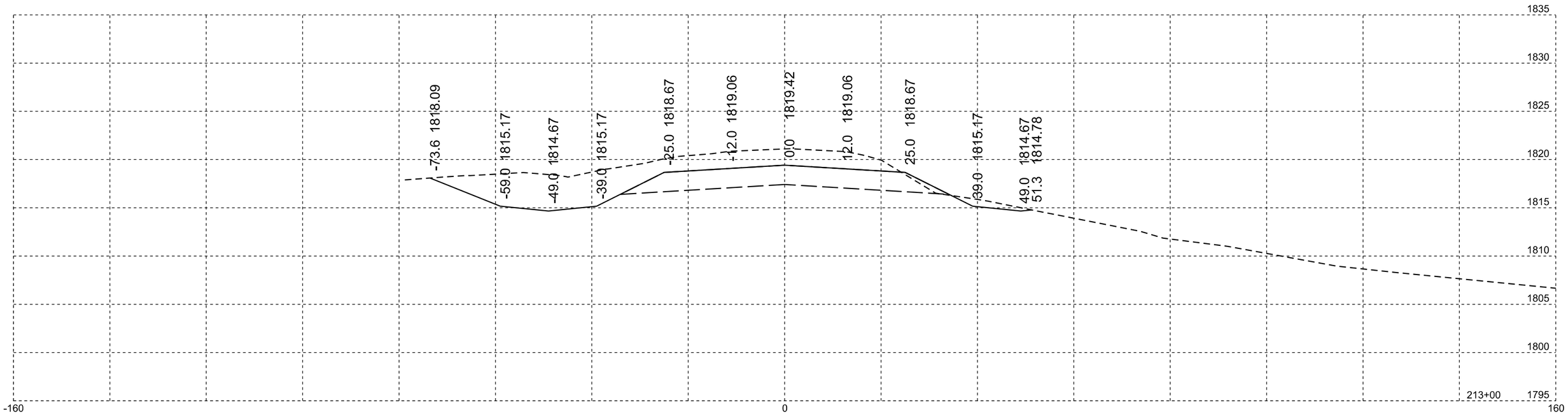
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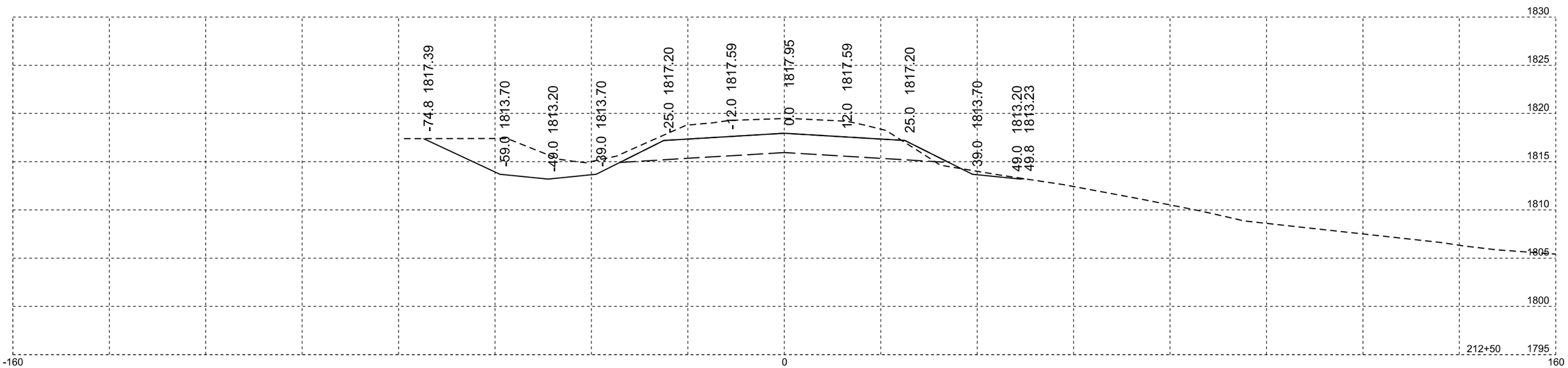
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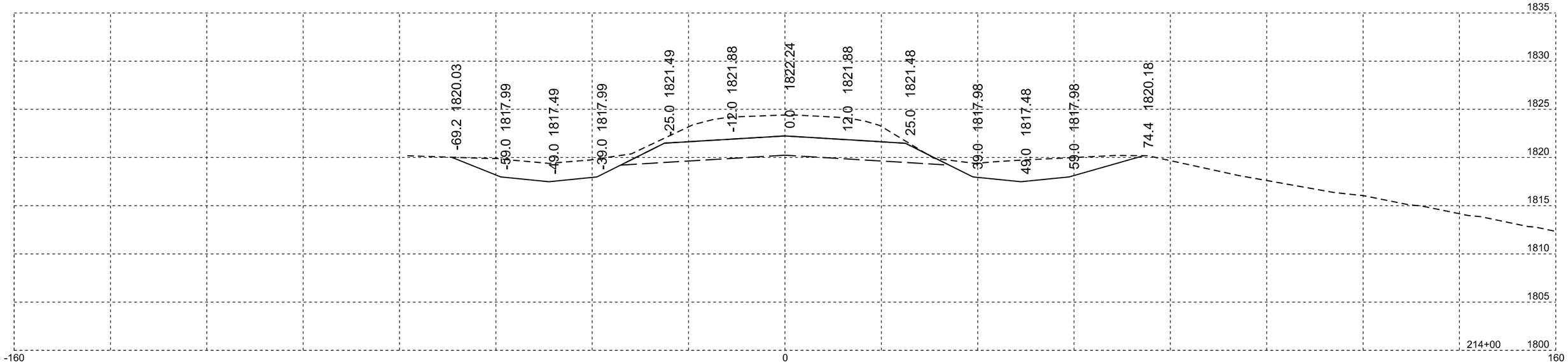
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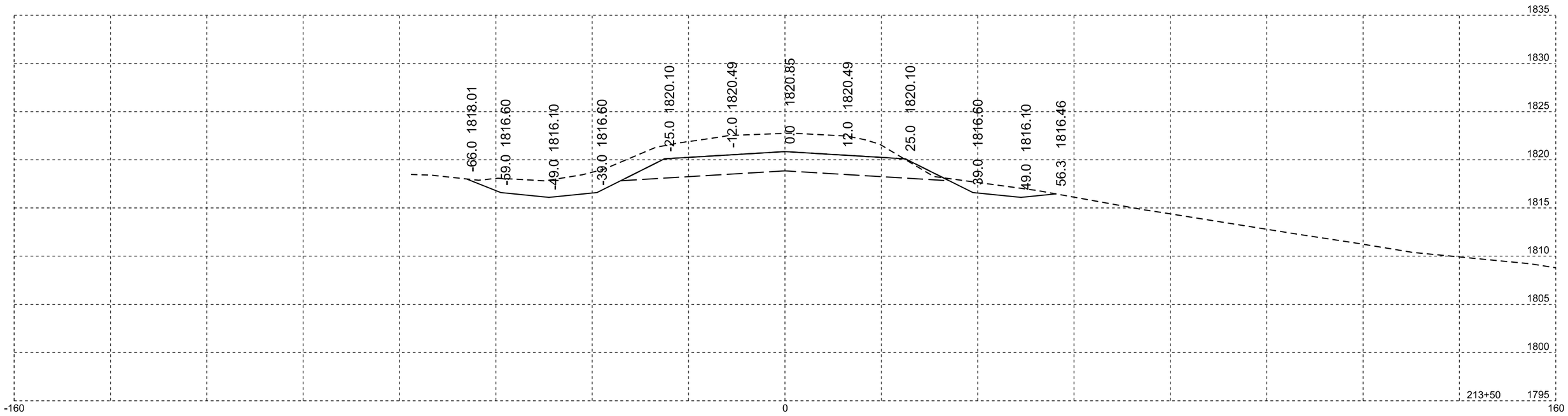
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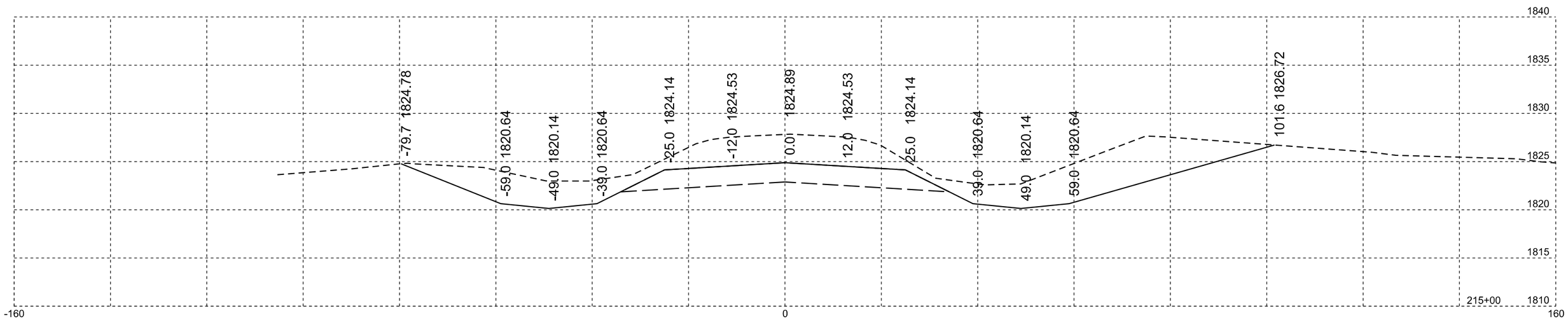
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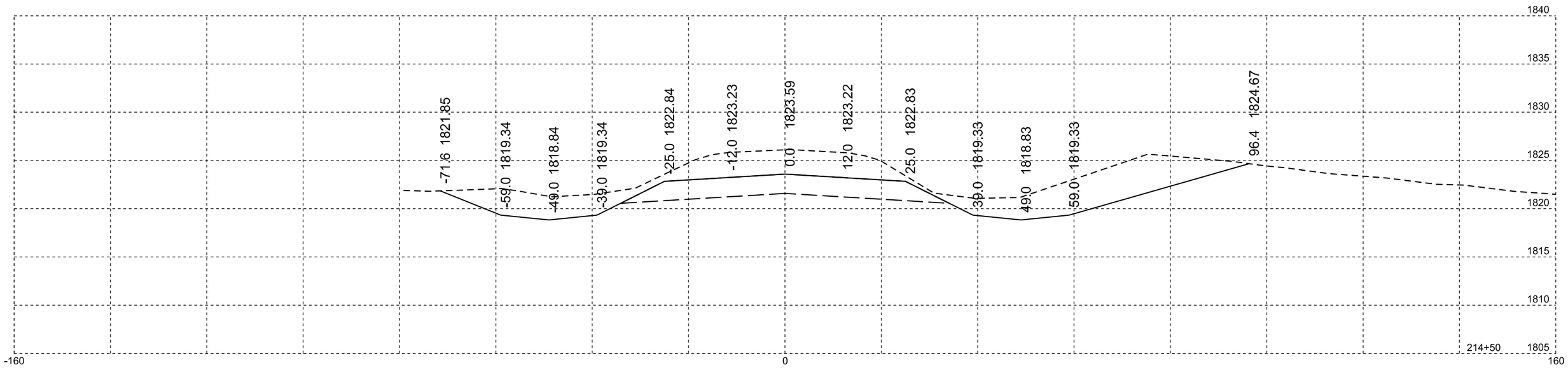
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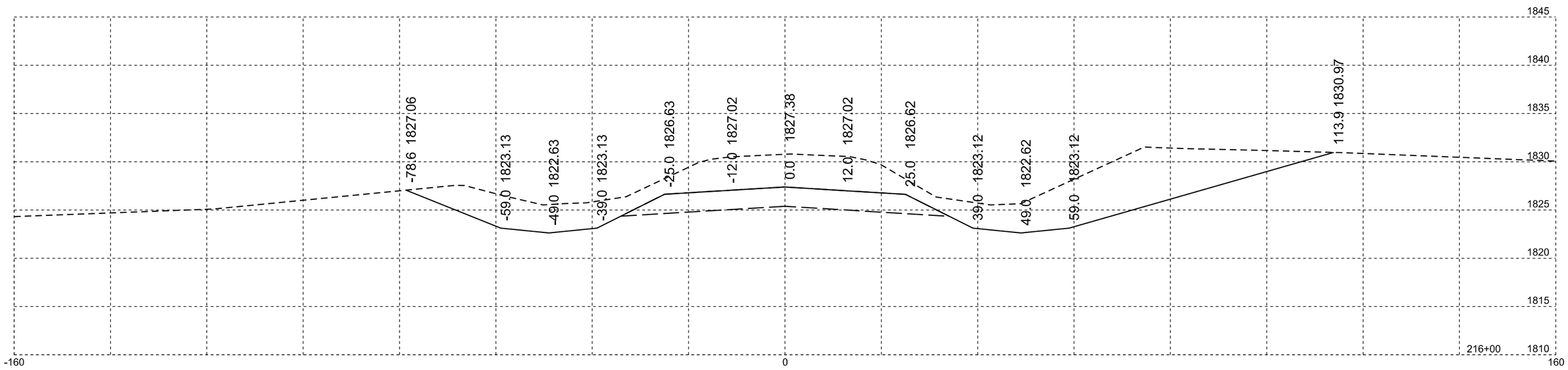
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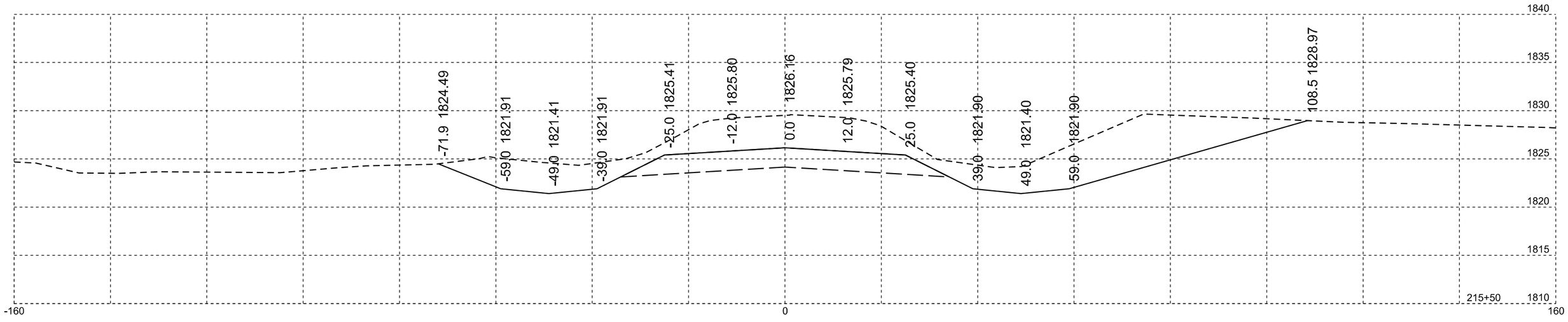
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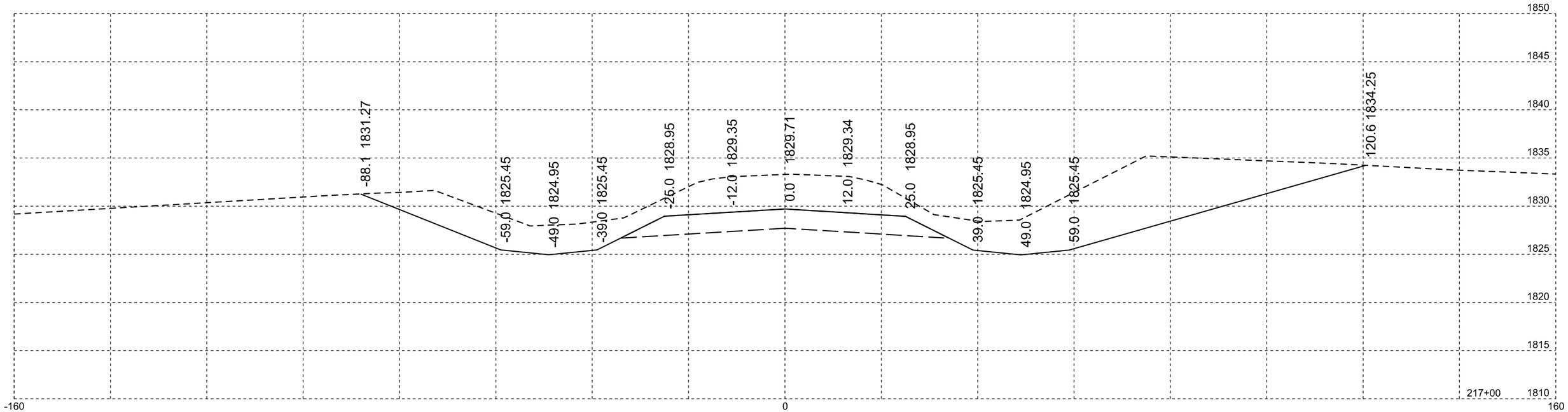
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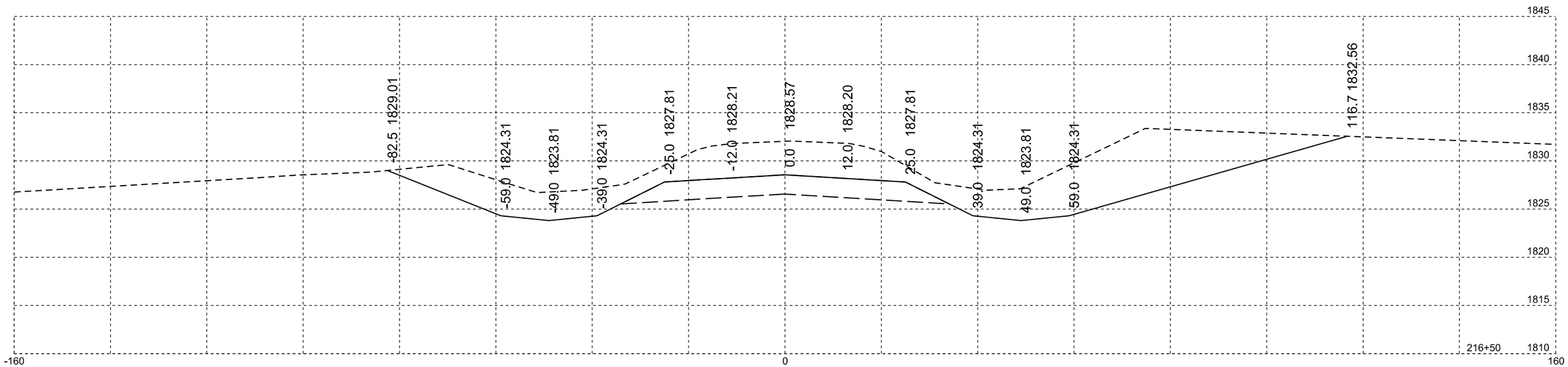
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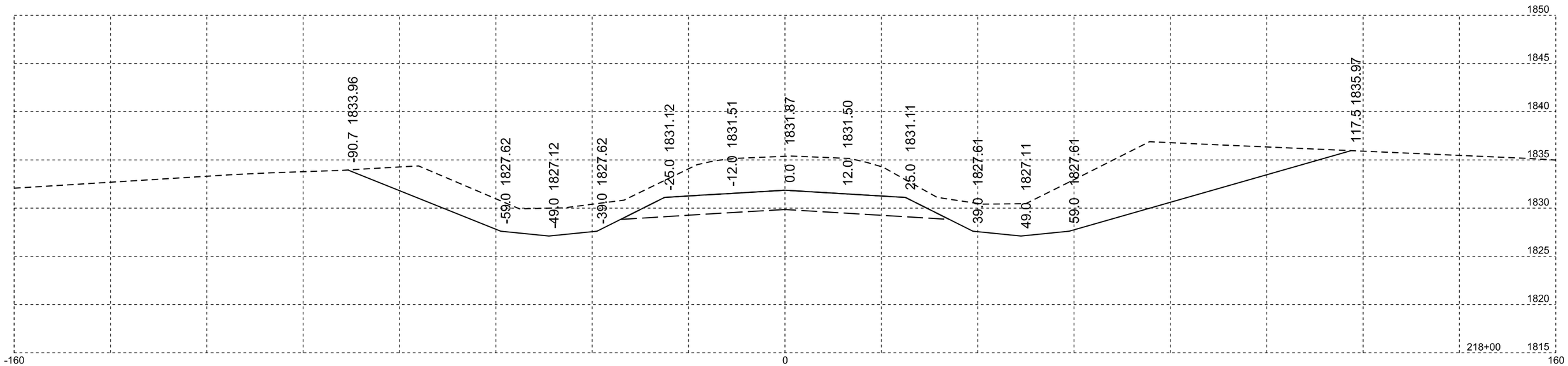
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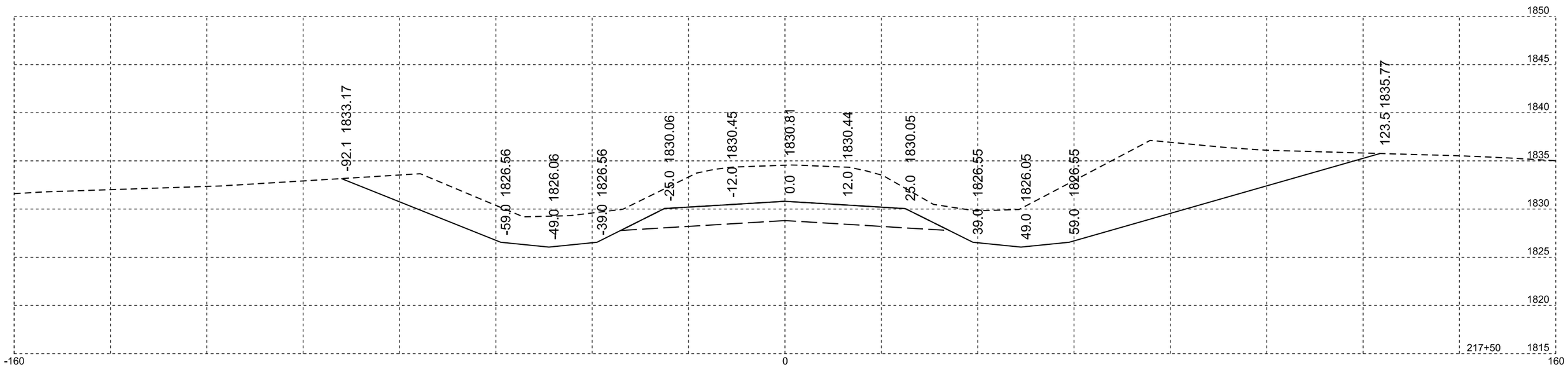
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Plotting Date: 12/19/2015

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
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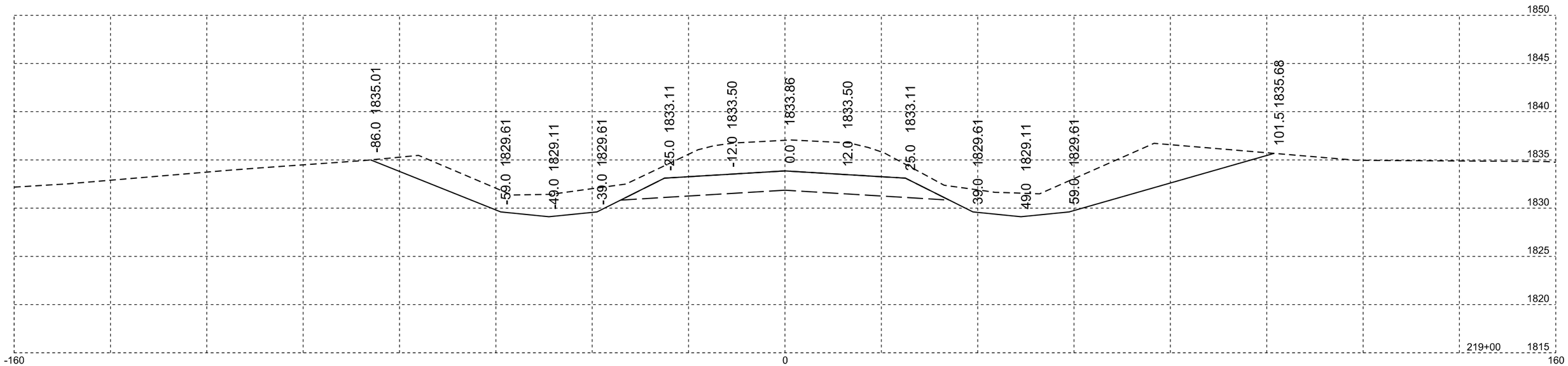

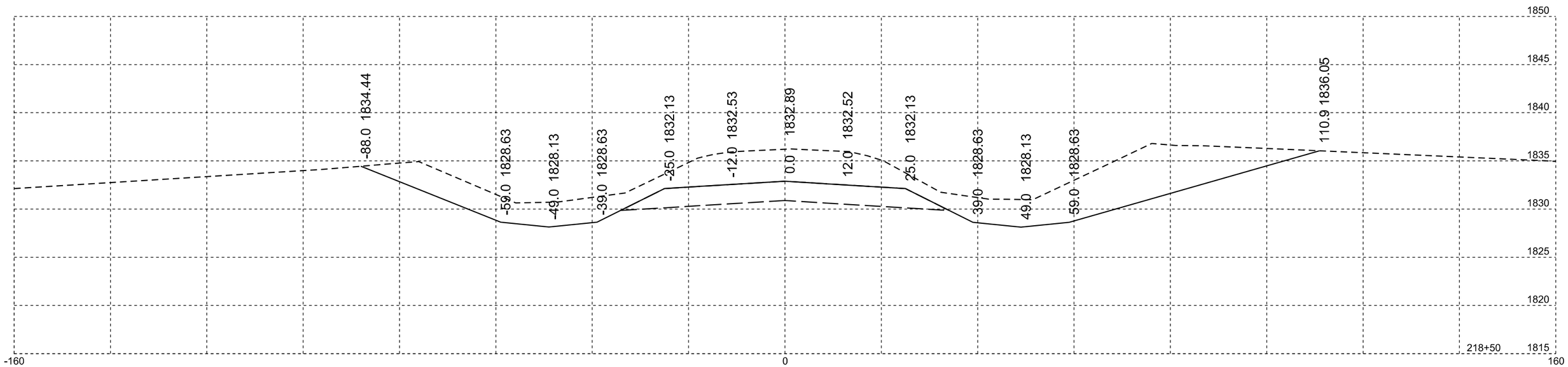

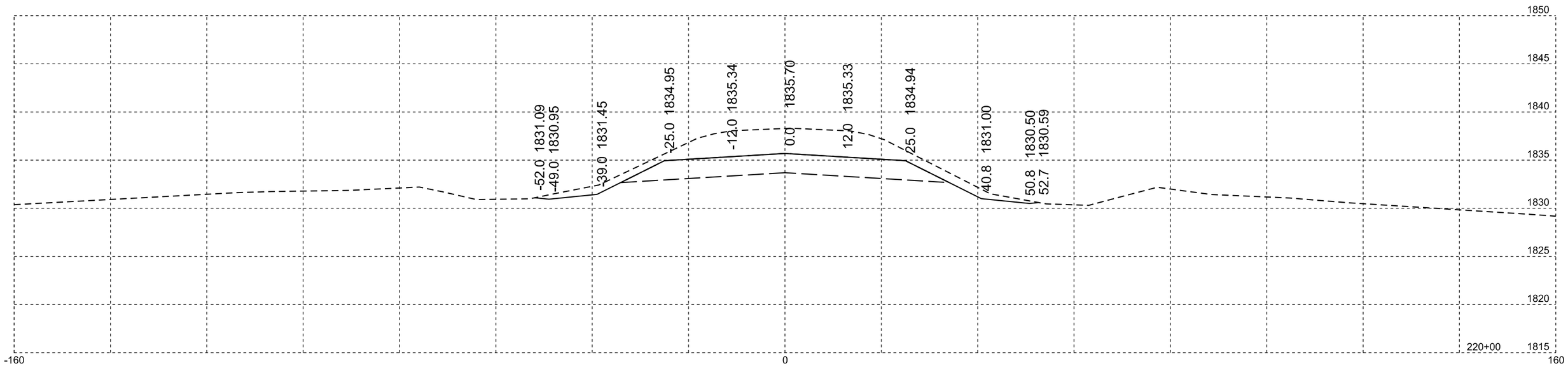
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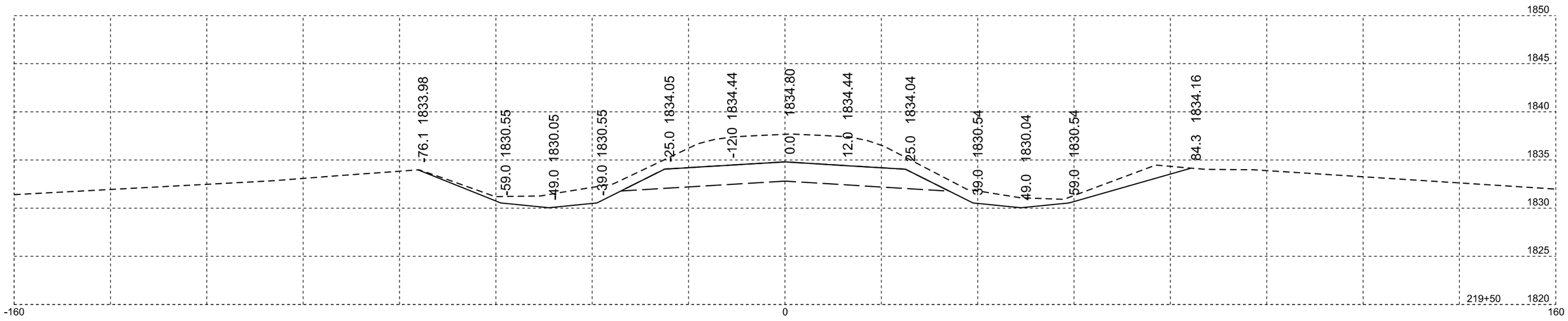
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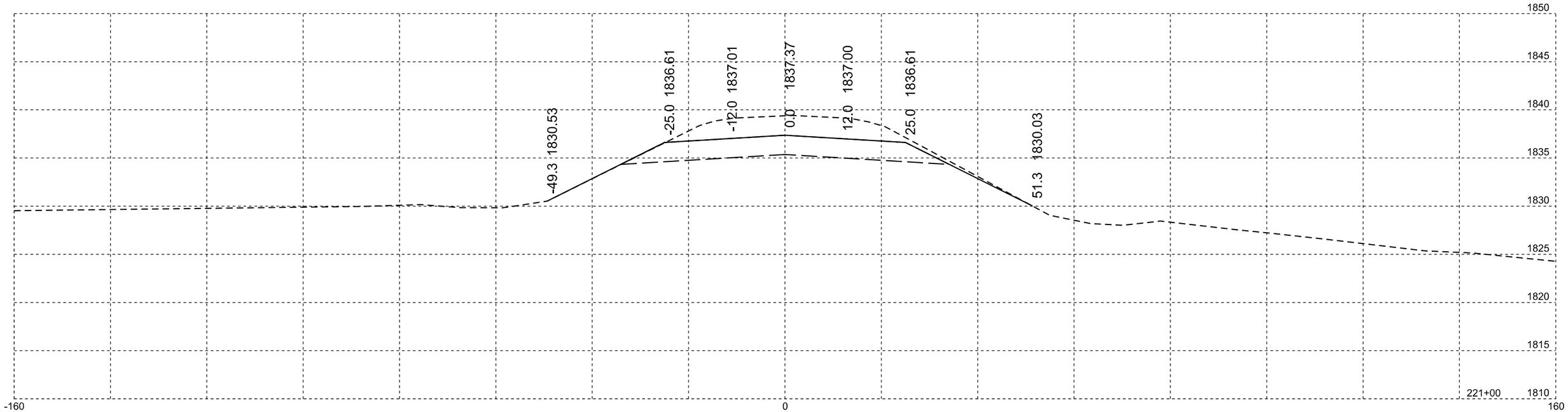
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-49.3 1830.53
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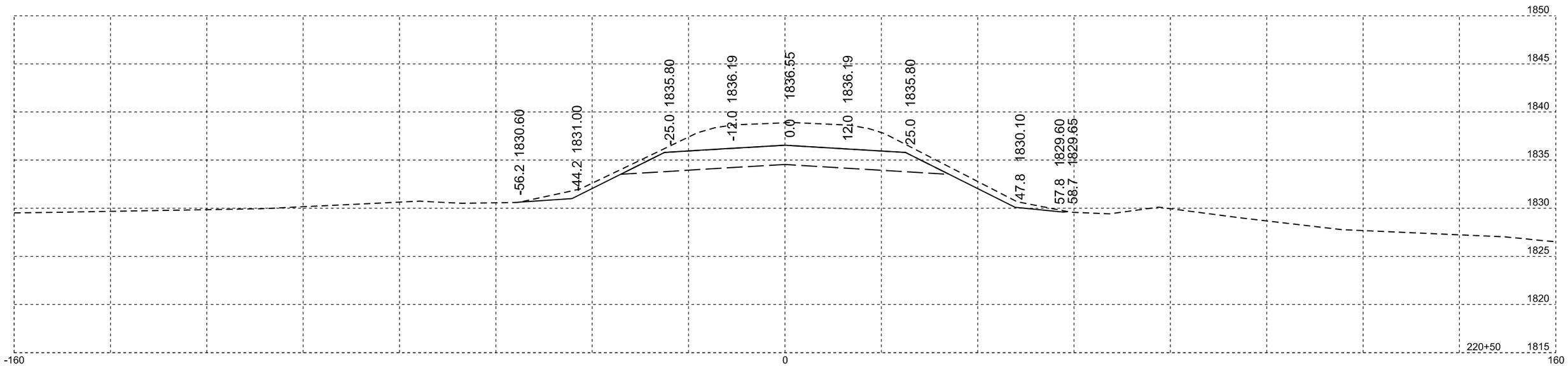
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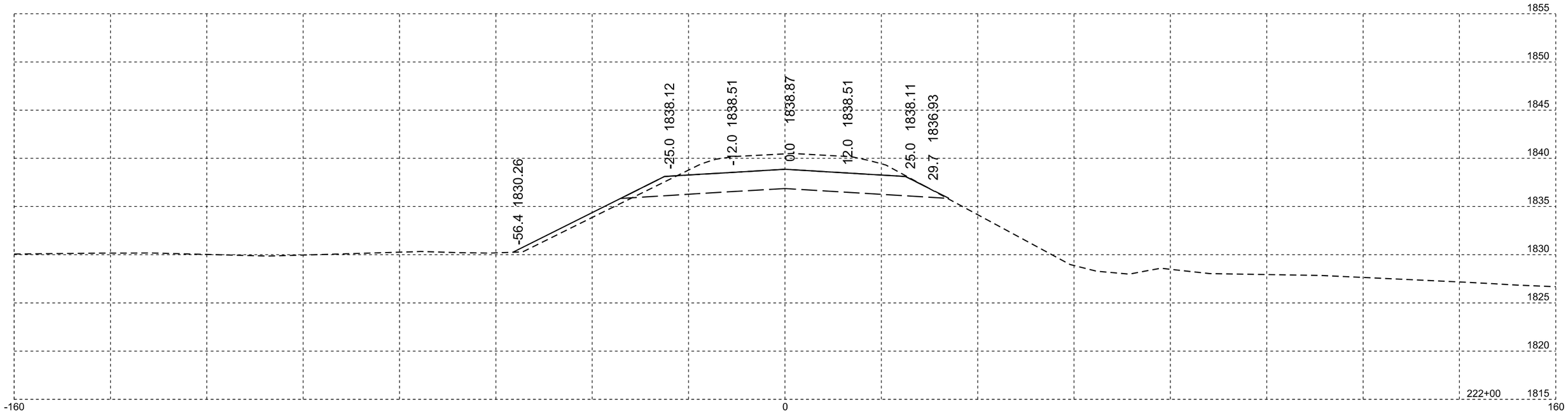
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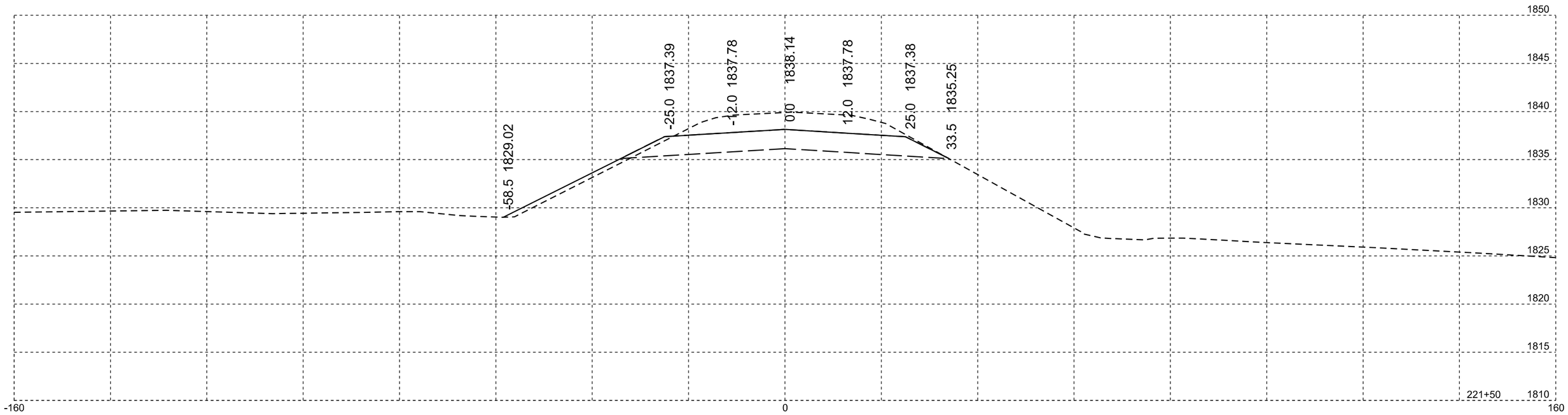
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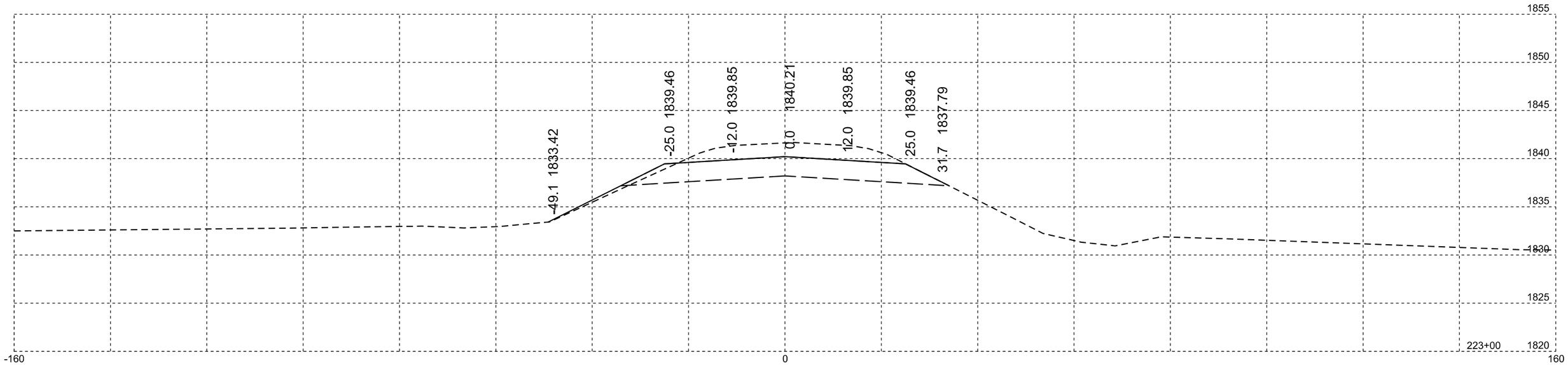
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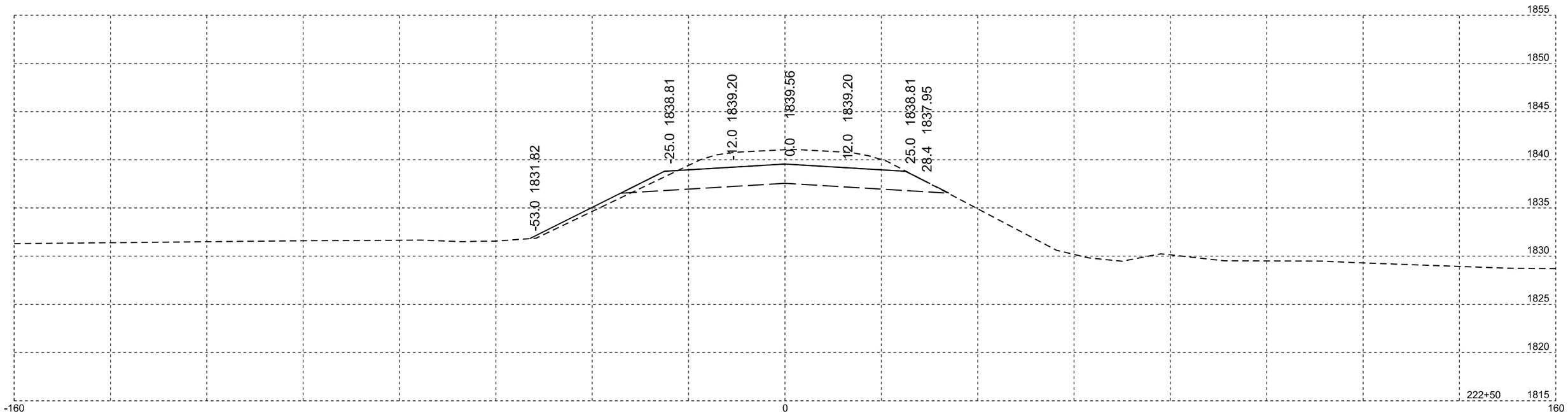
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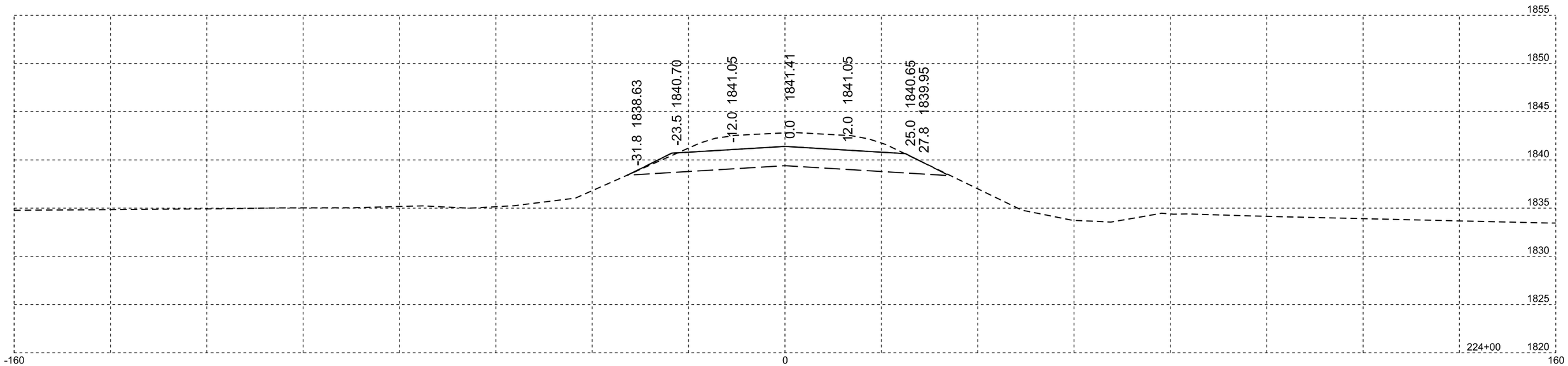
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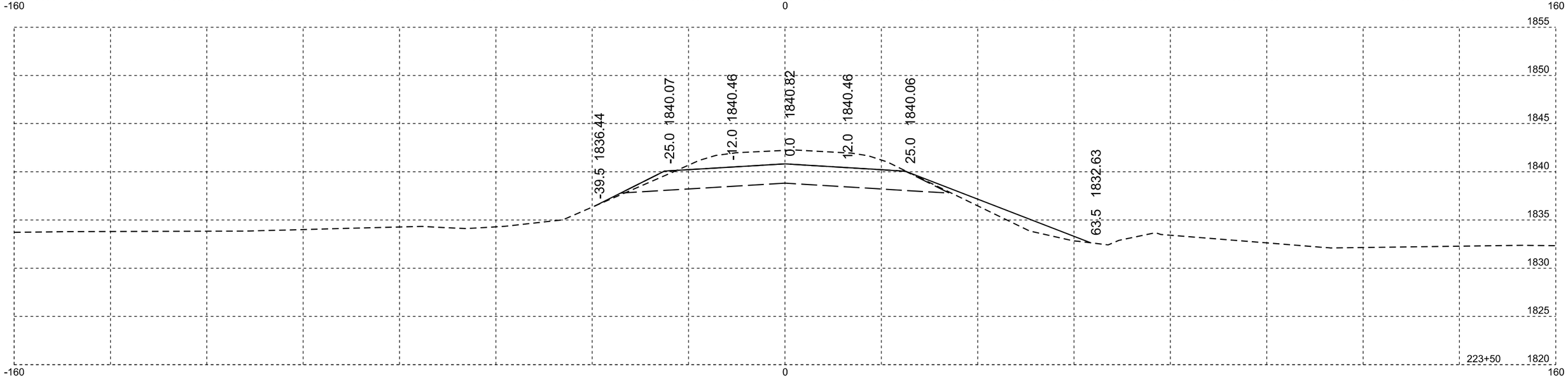
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-160
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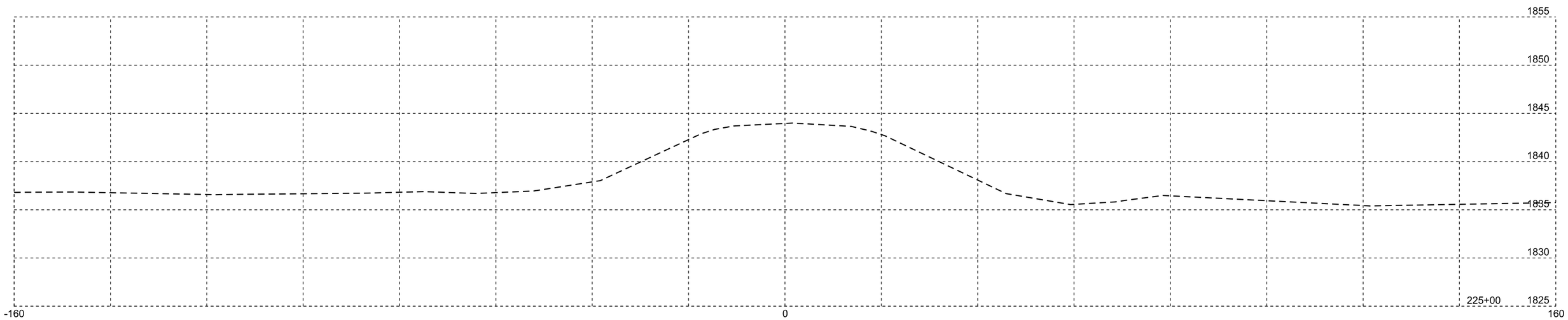
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1825
225+00
-160
0
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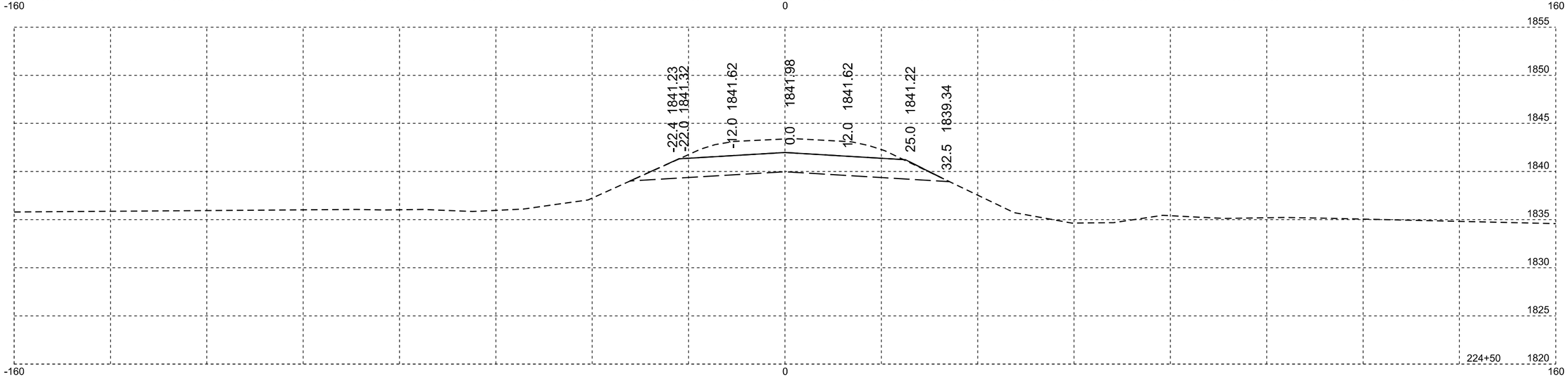
1855
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1840
1835
1830
1825
1820
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-160
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160
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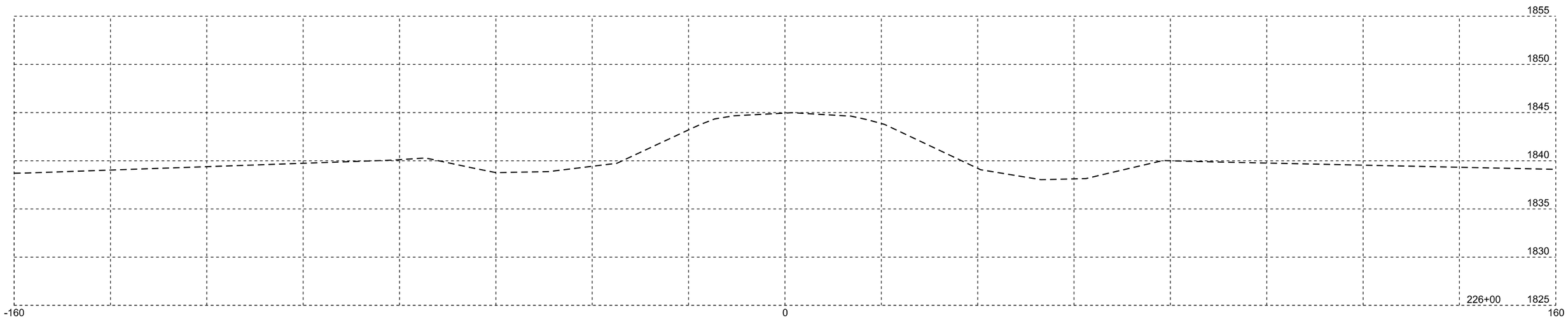
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226+00
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0
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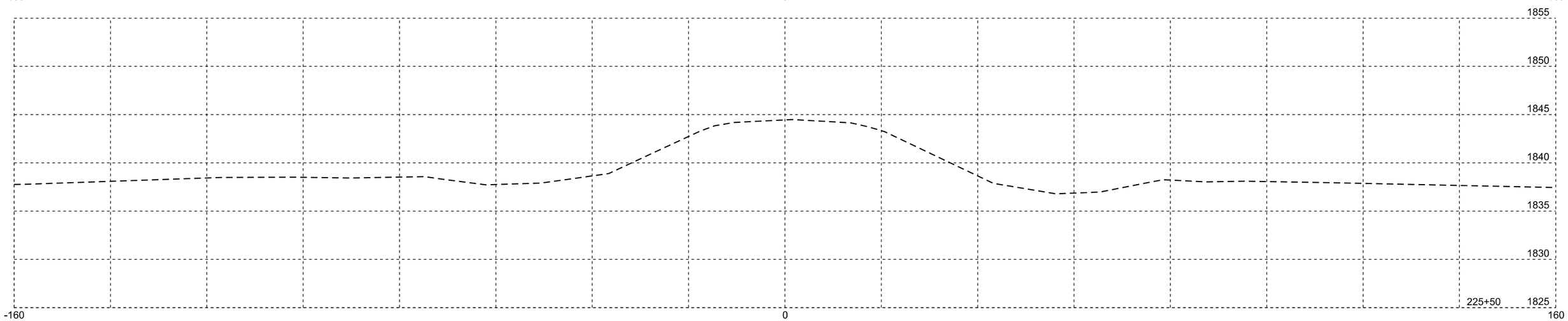
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1830
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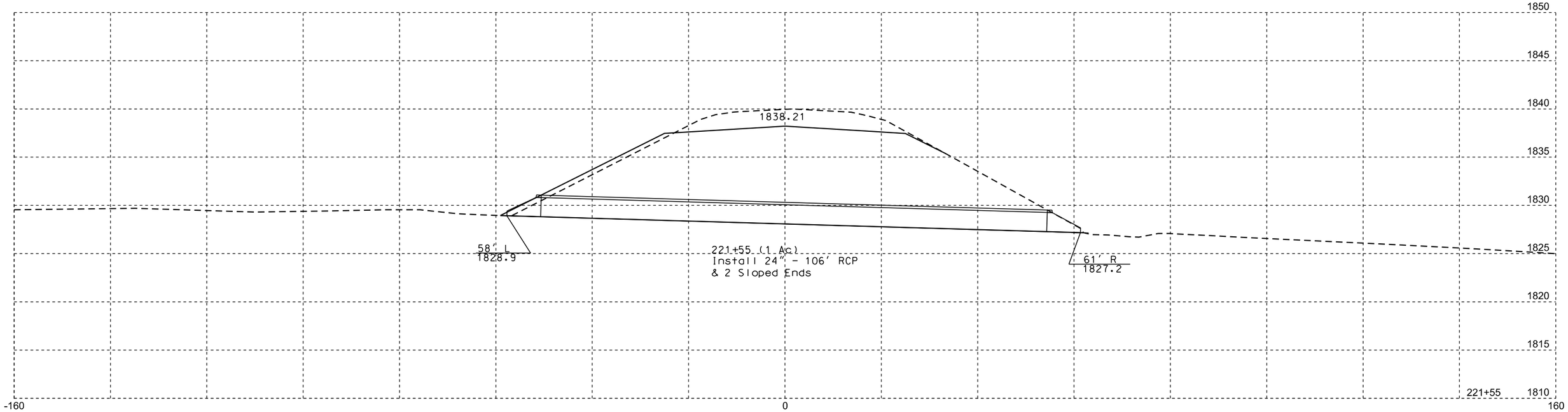
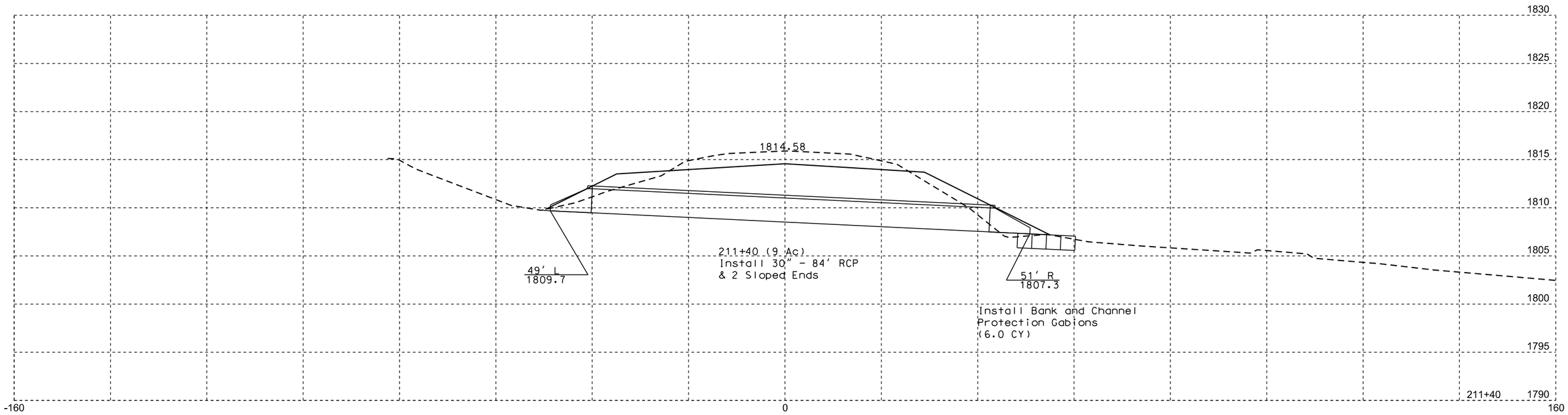
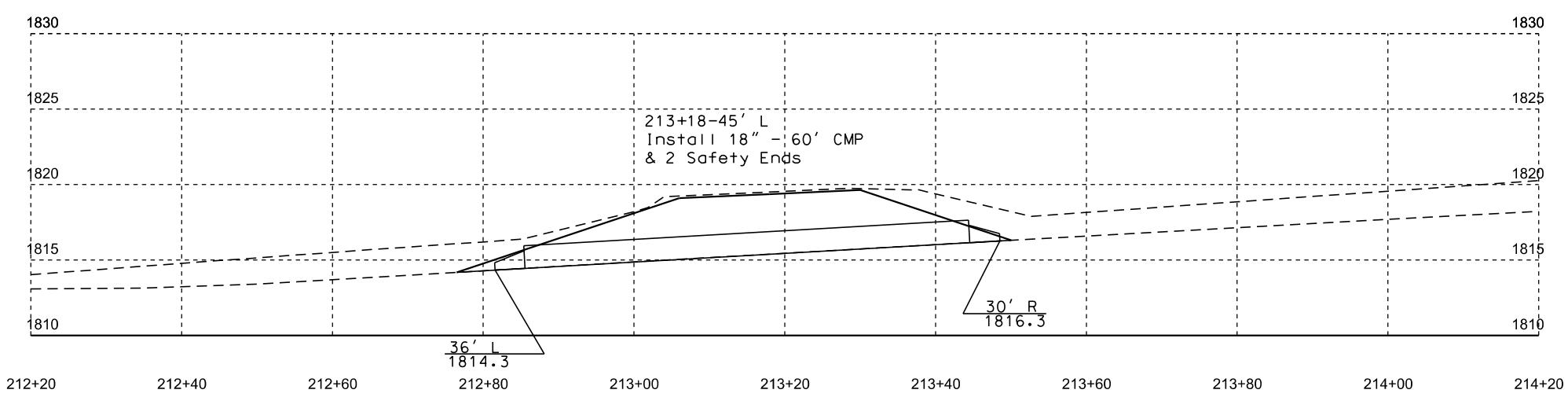

1850
1845
1840
1835
1830
1825
1820
1815
1810
1838.21
58' L
1828.9
221+55 (1 Ac)
Install 24" - 106' RCP
& 2 Sloped Ends
61' R
1827.2
221+55
-160
0
160

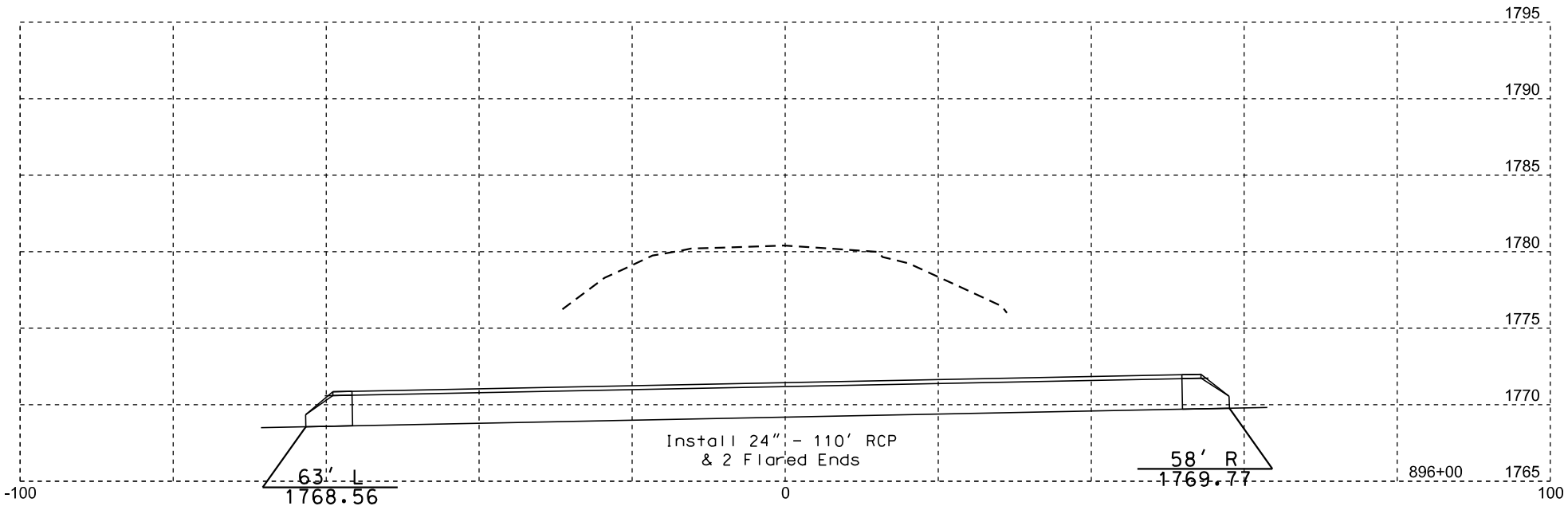

1830
1825
1820
1815
1810
1805
1800
1795
1790
1814.58
49' L
1809.7
211+40 (9 Ac)
Install 30" - 84' RCP
& 2 Sloped Ends
51' R
1807.3
Install Bank and Channel
Protection Gabions
(6.0 CY)
211+40
-160
0
160

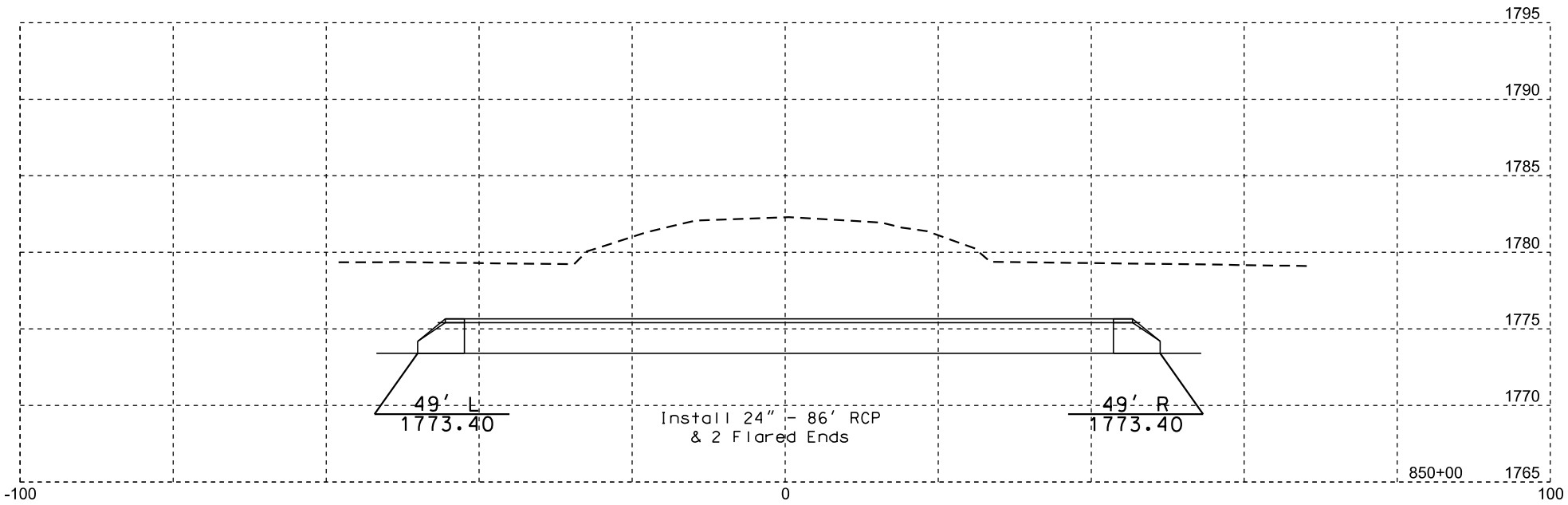


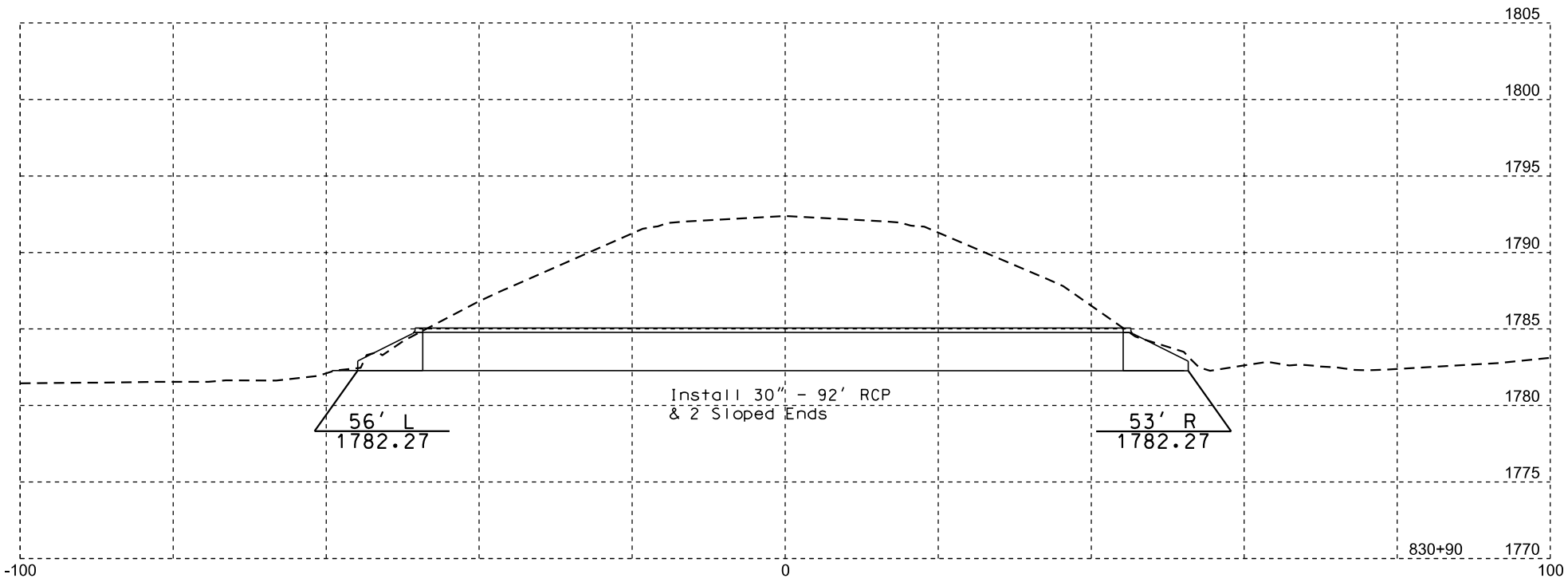
Plotting Date: 12/29/2015

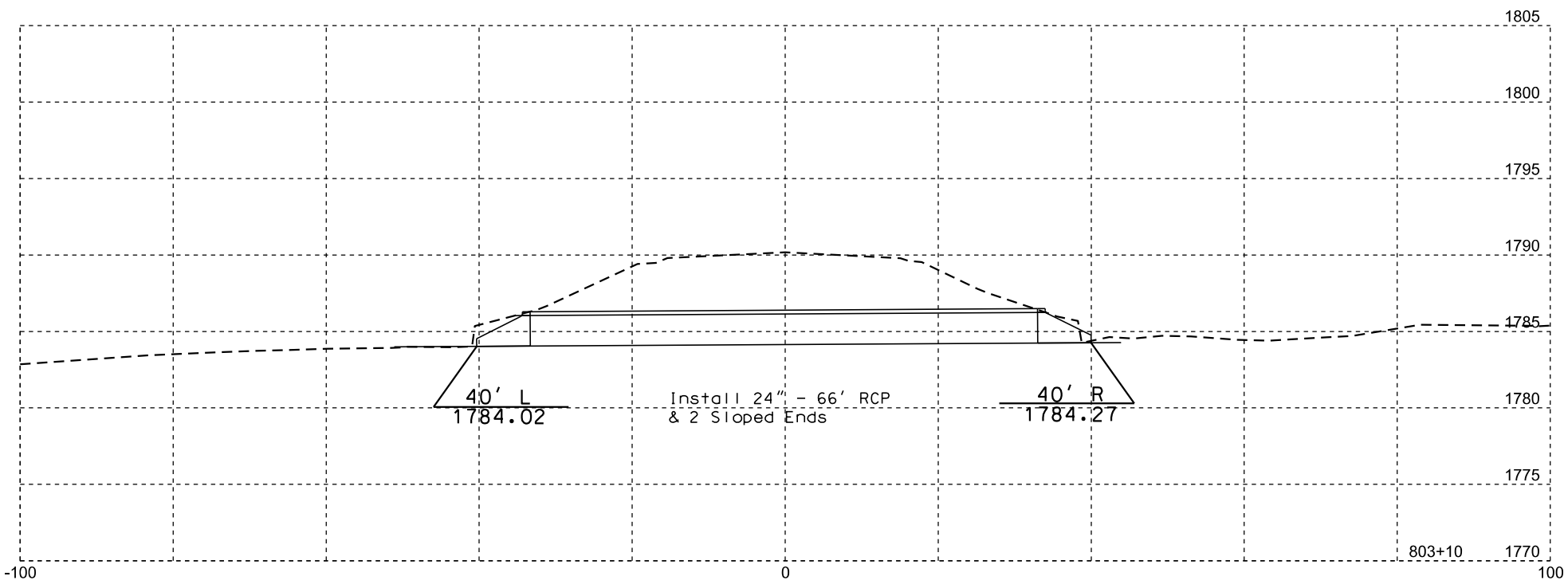
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	PH 0025(77)164	107	109

Pipe at 850+00 & 896+00
are to be set for at these
dimensions for future
shoulder widening









Plotting Date: 12/29/2015

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
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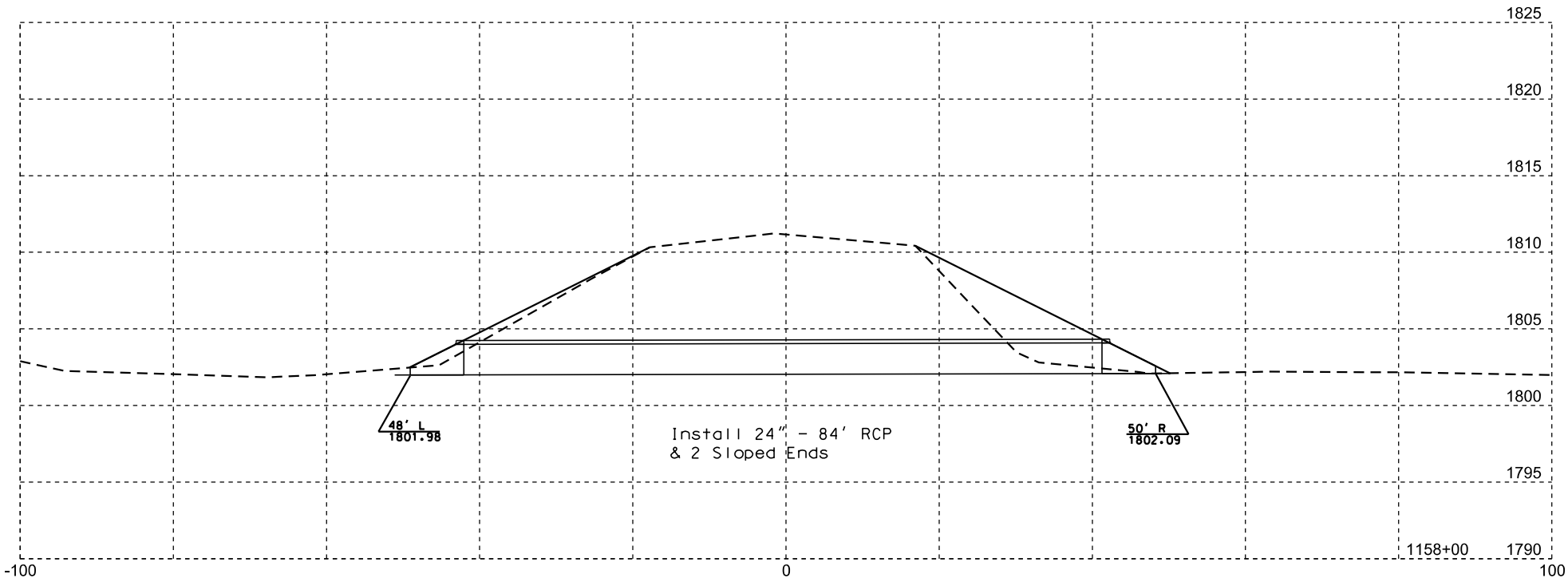

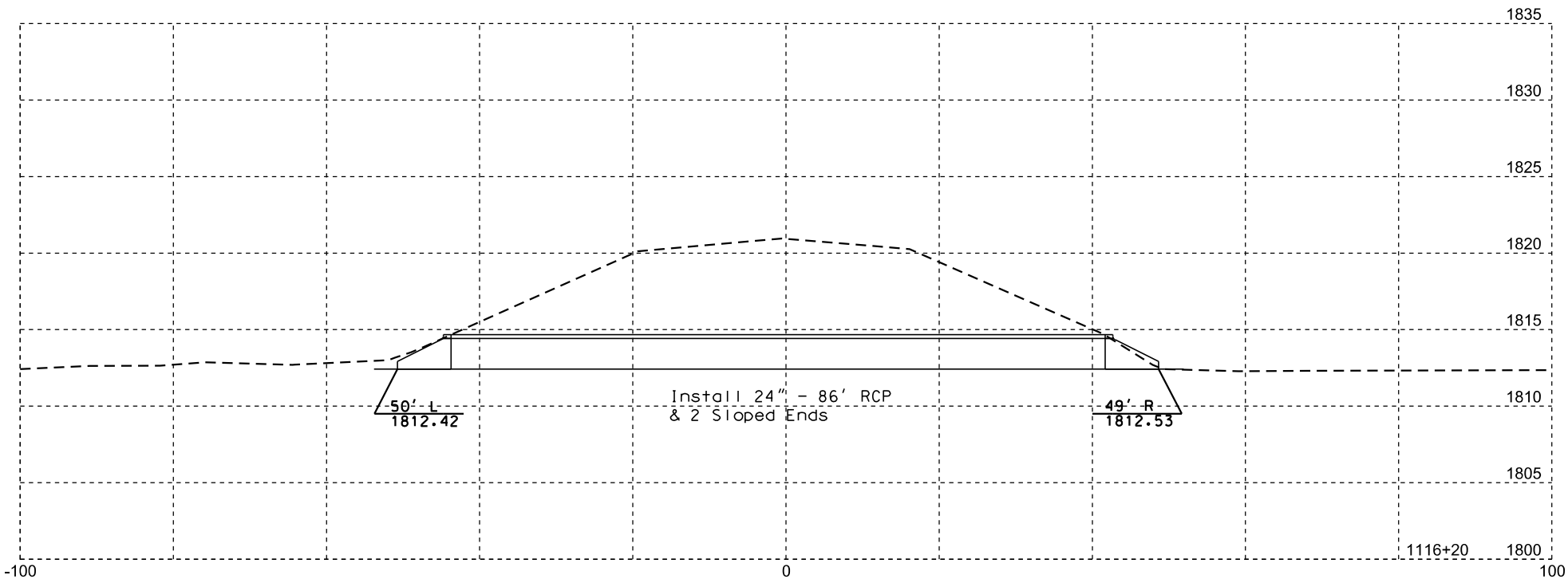

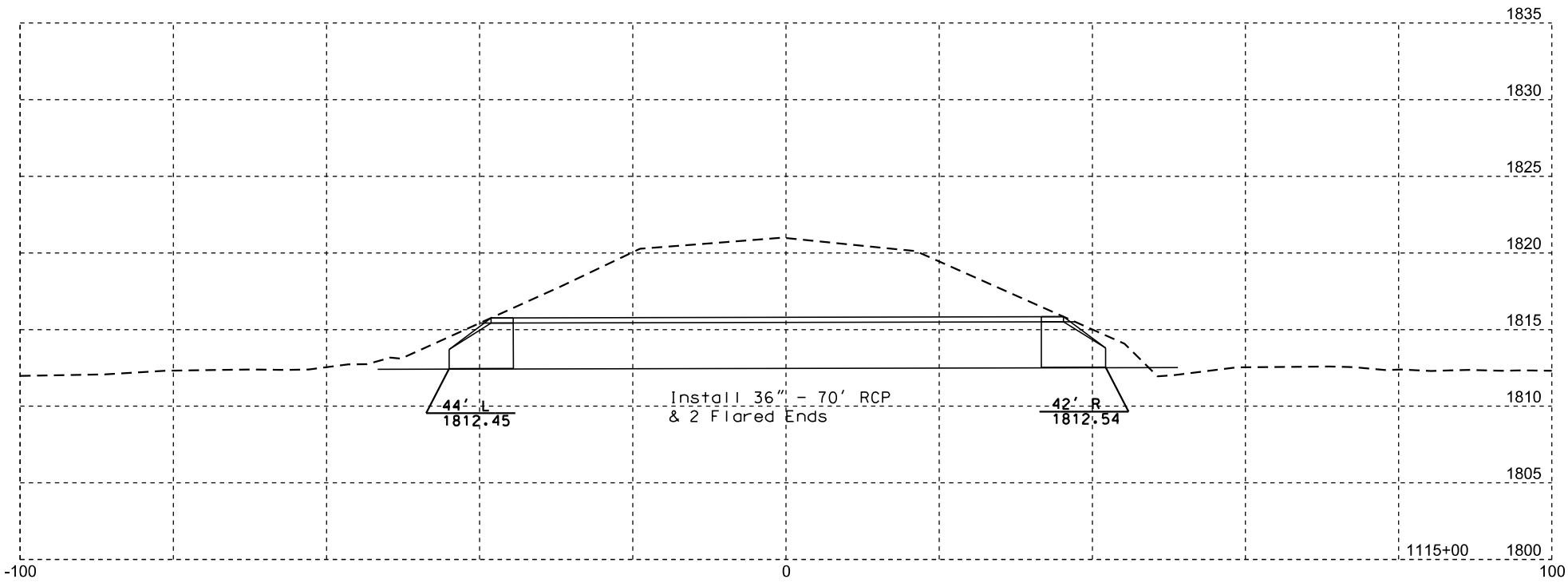

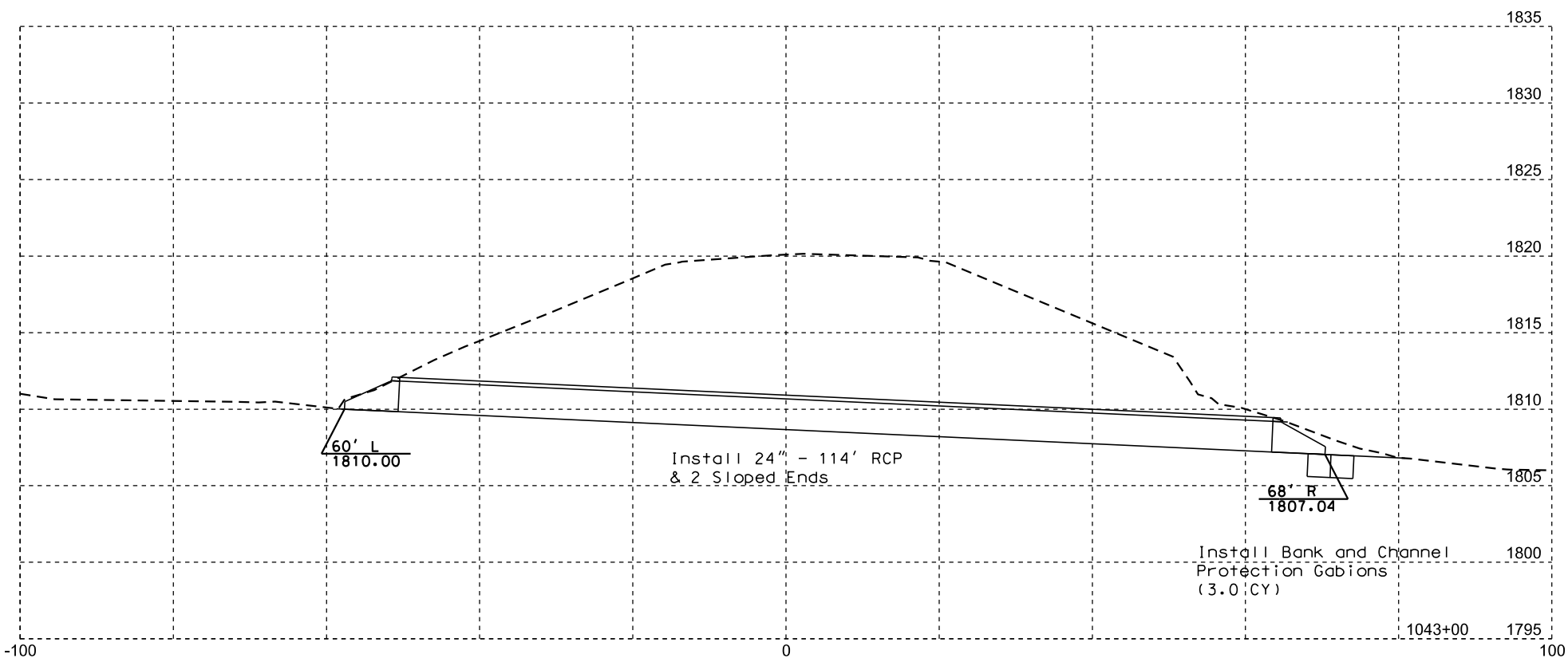

Plotting Date: 12/29/2015

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
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