

Plot Scale - 1:200

Plotted From - trc11951

STATE OF SOUTH DAKOTA  
DEPARTMENT OF TRANSPORTATION  
PLANS FOR PROPOSED  
**PROJECT 016A-491**  
**US HIGHWAY 16A**  
**CUSTER COUNTY**

SHOULDER DRAINAGE REPAIR

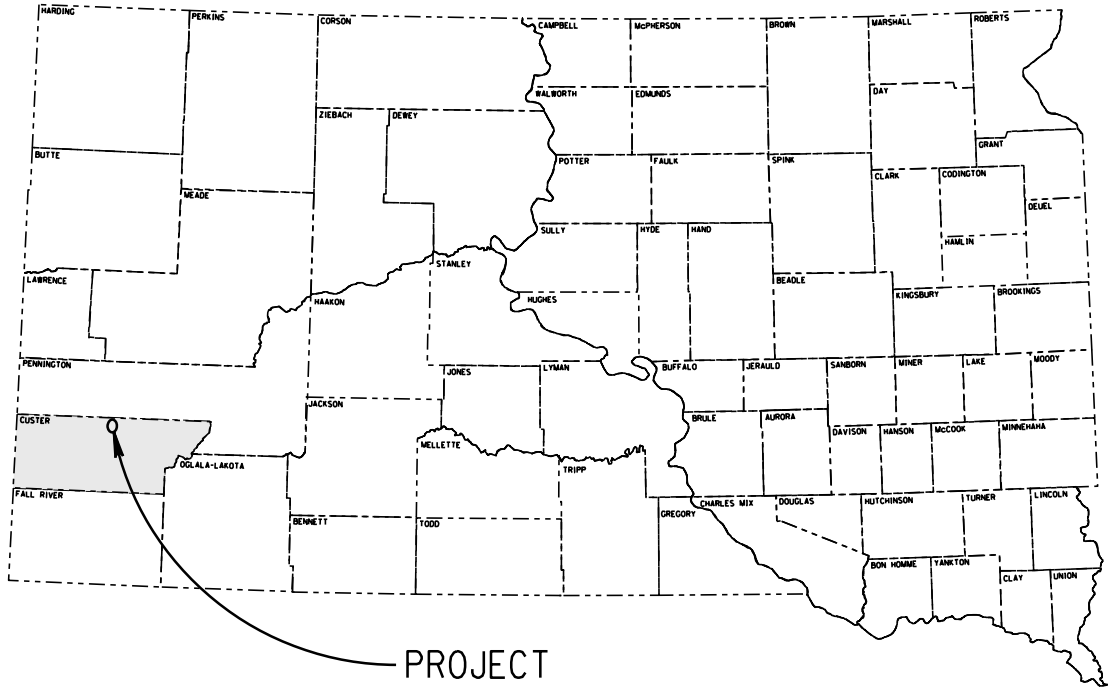
PCN i49e

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	016A-491	1	17

Plotting Date: 05/06/2016

INDEX OF SHEETS

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PROJECT

DESIGN DESIGNATION (US 16A)

ADT (2015)	1127
ADT (2035)	1369
DHV	216
D	51%
T DHV	3.6%
T ADT	8.0%
V	35 MPH

STORM WATER PERMIT

None Required

SCALE

SUBURBAN

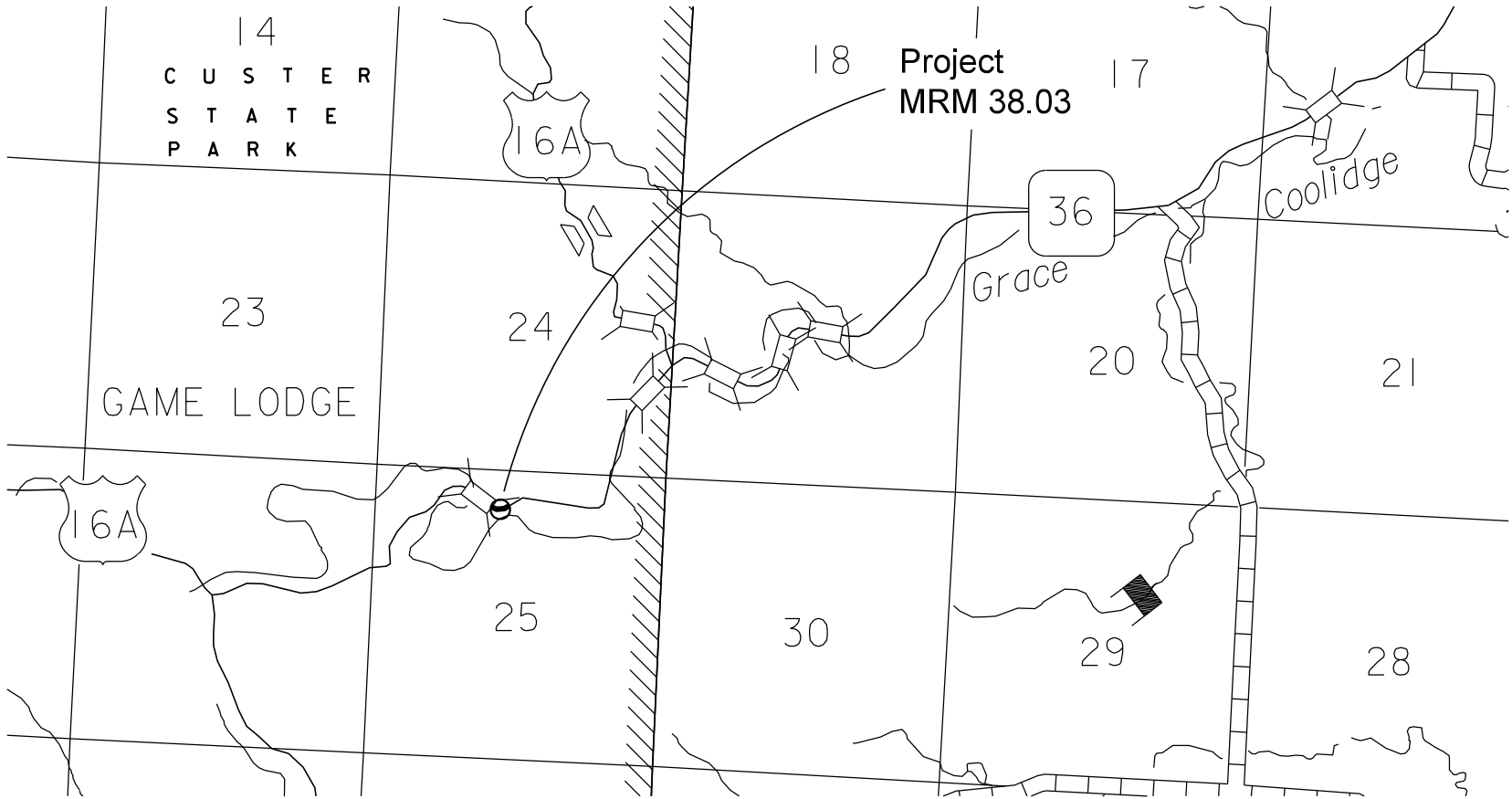
PLAN	1"=100'
PROFILE,	HORIZONTAL: 1"=100'
	VERTICAL: 1"=20'
CROSS SECTIONS	HORIZONTAL: 1"=20'
	VERTICAL: 1"=10'

R 6 E

R 7 E

T 3 S

T 3 S



GROSS LENGTH	500 FEET	0.095 MILES
LENGTH OF EXCEPTIONS	0.0 FEET	0.000 MILES
NET LENGTH	500 FEET	0.095 MILES

PLOT NAME -

FILE - ..\jtlb.rgn LE.DGN

ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
120E0010	Unclassified Excavation	78	CuYd
120E0600	Contractor Furnished Borrow Excavation	150	CuYd
230E0020	Contractor Furnished Topsoil	62	CuYd
260E1010	Base Course	48.9	Ton
634E0010	Flagging	80.0	Hour
634E0110	Traffic Control Signs	138.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
650E0079	Modified Type B68 Concrete Curb and Gutter	400	Ft
734E0010	Erosion Control	Lump Sum	LS
734E0154	12" Diameter Erosion Control Wattle	60	Ft

SPECIFICATIONS

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

UTILITIES

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

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.

COMMITMENT E: STORM WATER

Construction activities constitute less than 1 acre of disturbance.

Action Taken/Required:

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

COMMITMENT H: WASTE DISPOSAL SITE

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

Action Taken/Required:

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

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

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

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

- Construction and/or demolition debris consisting of concrete, asphalt concrete, or other similar materials shall be buried in a trench completely separate from wood debris. The final cover over the construction and/or demolition debris shall consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the Public 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 Public ROW through the use of fences, gates, and placement of a sign or signs at the entrance to the site stating “No Dumping Allowed”.
- Concrete and asphalt concrete debris may be stockpiled within view of the ROW for a period of time not to exceed the duration of the project. Prior to project completion, the waste shall be removed from view of the ROW or buried and the waste disposal site reclaimed as noted above.

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

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

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

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	016A-491	2	17

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.

SAWING EXISTING ASPHALT CONCRETE

Where new curb and gutter is placed adjacent to existing asphalt concrete, the existing asphalt concrete shall be sawed full depth to a true line with a vertical face. The saw cutting shall follow the alignment for the new curb and gutter. The concrete for the curb and gutter shall be poured against the existing asphalt concrete and a form will not be required.

No separate payment shall be made for sawing and shall be incidental to the various asphalt concrete bid items on the project.

UNCLASSIFIED EXCAVATION

Unclassified Excavation is provided on the project to remove existing material for the installation of new curb and gutter. The estimated quantity for performing this work is 78 cubic yards. The existing asphalt surfacing shall be handled as waste. The remaining material may be used as backfill for the curb and gutter. Plans quantity shall be the basis of payment and field measurement will not be required.

CONTRACTOR FURNISHED BORROW EXCAVATION

Contractor Furnished Borrow material is provided on the project to backfill the curb and gutter. The estimated quantity to perform this work is 150 cubic yards.

The Contractor shall provide a suitable site for Contractor furnished borrow material. The Contractor is responsible for obtaining all required permits and clearances for the borrow site, prior to disturbance of the area. The borrow material shall be approved by the Engineer.

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

TABLE OF CURB AND GUTTER ELEVATIONS

	Edge of Pavement		slope (ft./ft.)	Gutter Elevation	Drop Between Stations (ft.)
4+50	98.29		0.02	98.21	
4+00	97.39		0.02	97.31	0.90
3+50	96.94		0.02	96.86	0.45
3+00	96.97		0.04	96.82	0.05
2+50	97.07		0.08	96.76	0.05
2+00	97.14		0.12	96.68	0.08
1+50	97.3		0.2	96.53	0.15
1+00	96.99		0.2	96.22	0.31
0+50	96.4		0.2	95.63	0.59

Add 3800 to the elevations above

TABLE OF MODIFIED TYPE B68 CURB AND GUTTER

Station to	Station	L/R	Modified Type B68 Concrete Curb and Gutter (Ft)
0+50	4+50	L	400.0

RATES OF MATERIALS

US 16A  
Sta. 0+50 to Sta. 4+50

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

Base Course shall be applied at the rate of 12.2 ton for a 5' width.

Water for Granular Material at the rate of (12 gallons per ton)

Water for Granular Material shall be incidental to the contract unit price per ton for Base Course.

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

TABLE OF BASE QUANTITIES

Sta. to	Sta.	Base Course (Ton)
0+50	4+50	48.9

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	016A-491	3	17

HORIZONTAL ALIGNMENT DATA

POB	-0+72.87	536458.936	1171307.593
	Tangent Direction: S 44°02'25" E		Tangent Length: 73.98
PC	0+01.11	536405.756	1171359.020
PI	0+95.92	536337.599	1171424.932
	Radius: 326.06		Delta: 32°25'40" Left
PT	1+85.65	536315.413	1171517.114
	Tangent Direction: S 76°28'05" E		Tangent Length: 7.51
PC	1+93.16	536313.656	1171524.416
PI	3+10.44	536286.213	1171638.445
	Radius: 217.97		Delta: 56°33'59" Left
PT	4+08.36	536366.252	1171724.173
	Tangent Direction: N 46°57'56" E		Tangent Length: 93.62
POE	5+01.98	536430.143	1171792.605

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.

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

Station	L/R	Description	12" Diameter Erosion Control Wattle (Ft)
0+10	L	Across Ditch	20
0+20	L	Across Ditch	20
0+30	L	Across Ditch	20
Total			60

CONTRACTOR FURNISHED TOPSOIL

Contractor furnished topsoil shall be free from clay lumps, stones, coarse gravel, or similar objects larger than 1/2 inch in diameter. Brush, stumps, roots, wood, objectionable weeds, litter, or any other material which may be harmful to plant growth will not be allowed. Organic material shall be decomposed.

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

EROSION CONTROL

The estimated area requiring erosion control is 5000 square feet. All costs for the erosion control work for furnishing, placing, and maintaining erosion control including equipment, labor, seeding, fertilizing, and mulching shall be incidental to the contract lump sum price for "Erosion Control".

The limits of erosion control work will be determined by the Engineer during construction.

FERTILIZING

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

The application rate is 1,500 pounds per acre.

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 <a href="http://www.sustane.com/">http://www.sustane.com/</a>

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:

<i>Glomus intraradices</i>	25%
<i>Glomus aggregatu</i>	25%
<i>Glomus mosseae</i>	25%
<i>Glomus etunicatum</i>	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 lump sum for "Erosion Control".

HYDROSEEDING

The areas to be hydroseeded with Type F Permanent Seed Mixture shall comprise of all newly graded areas steeper than a 3:1 or too narrow for a press drill to operate within the project limits.

Type F Permanent Seed Mixture shall consist of the following:

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

Hydroseeding shall be done by applying a mixture of water and seed at locations determined by the Engineer during construction.

The equipment used for hydroseeding shall be a mechanical agitation hydroseeding machine.

All costs for hydroseeding including equipment, labor, and materials which include the water and seed shall be incidental to the contract lump sum price for "Erosion Control"

FIBER MULCHING

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

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

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

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

All costs for the additional tackifier added to the fiber mulch including labor, equipment, and materials shall be incidental to the contract lump sum price for "Erosion Control".

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

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

TRAFFIC CONTROL – GENERAL NOTES

Unless otherwise stated in these plans, no work will be allowed during hours of darkness.

Existing guide, route, informational logo, regulatory, warning signs and delineation shall be temporarily reset and maintained during construction as directed by the Engineer. Removing, relocating, salvaging and resetting of the above items shall be the responsibility of the Contractor.

Non-applicable traffic control devices shall be completely covered or removed during periods of inactivity. Periods of inactivity shall be defined as no work taking place for a period of more than 48 hours.

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

The Contractor shall provide installation details at the preconstruction meeting for all breakaway sign support assemblies.

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

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

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

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

REFLECTORIZED SHEETING REQUIREMENTS FOR TEMPORARY TRAFFIC CONTROL DEVICES

Delete the first paragraph of Section 984.1 and replace with the following:

Temporary traffic control devices, including signs, drums, cones, tubular markers, barricades, vertical panels, and direction indicator barricades shall be reflectorized with sheeting applied to a satisfactory backing. For all temporary traffic control warning signs, the reflective sheeting shall meet or exceed the standards of Type VII, Type VIII, Type IX, or Type XI as defined by AASHTO M 268 (ASTM D4956). For all other temporary traffic control signs, the reflective sheeting shall meet or exceed the standards of Type IV, Type V, Type VII, Type VIII, Type IX, or Type XI as defined by AASHTO M 268 (ASTM D4956). For barricades, vertical panels, and direction indicator barricades; the reflective sheeting shall meet or exceed the standards of Type III as defined by AASHTO M 268 (ASTM D4956). Round surfaced temporary traffic control devices including, but not limited to; drums, cones, and tubular markers shall be reflectorized with reflectorized sheeting meeting or exceeding the standards of Type IV as defined by AASHTO M 268 (ASTM D4956). All orange colored material shall be fluorescent.

SIGN INVENTORY

SIGN CODE	SIGN DESCRIPTION	#	SIGN SIZE	SQFT PER SIGN	SQFT
W3-4	BE PREPARED TO STOP	2	48" x 48"	16	32
W20-1	ROAD WORK AHEAD	2	48" x 48"	16	32
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	16	32
W20-7	FLAGGER (symbol)	2	48" x 48"	16	32
G20-2	END ROAD WORK	2	36" x 18"	5	10
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS			138
		SQFT			

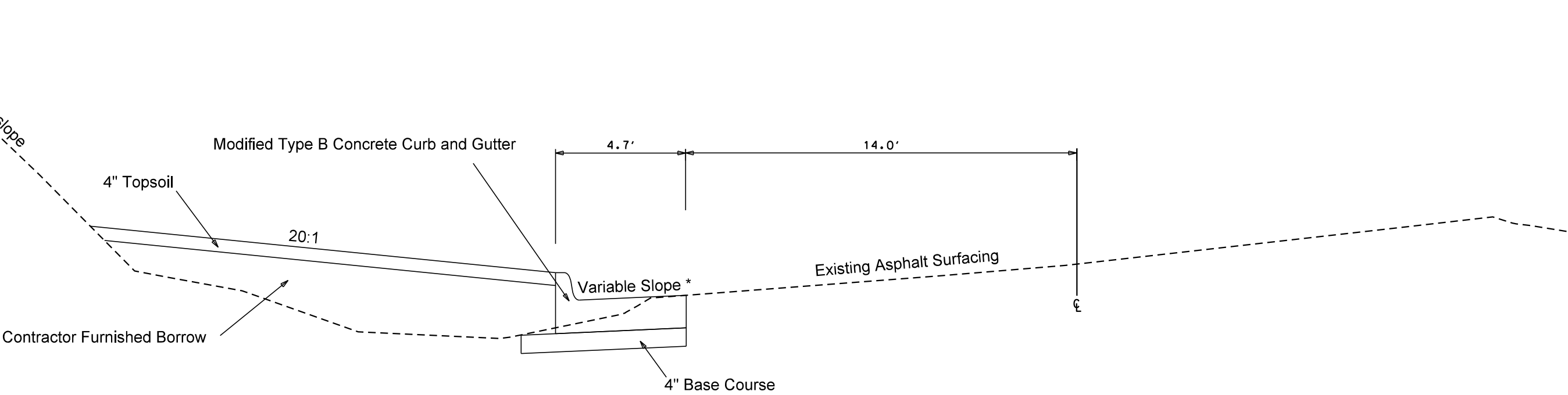
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	016A-491	5	17

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	016A-491	6	17

Plotting Date: 04/15/2016

# TYPICAL GRADING AND SURFACING SECTION

0+50 to 4+50



\* See cross sections and table in the plans for the variable slope.  
The variable slope is needed to acheive positive drainage around the curve.

PLOT SCALE - 1"=4'

PLOTTED FROM - TRRC11951

PLOT NAME - 10

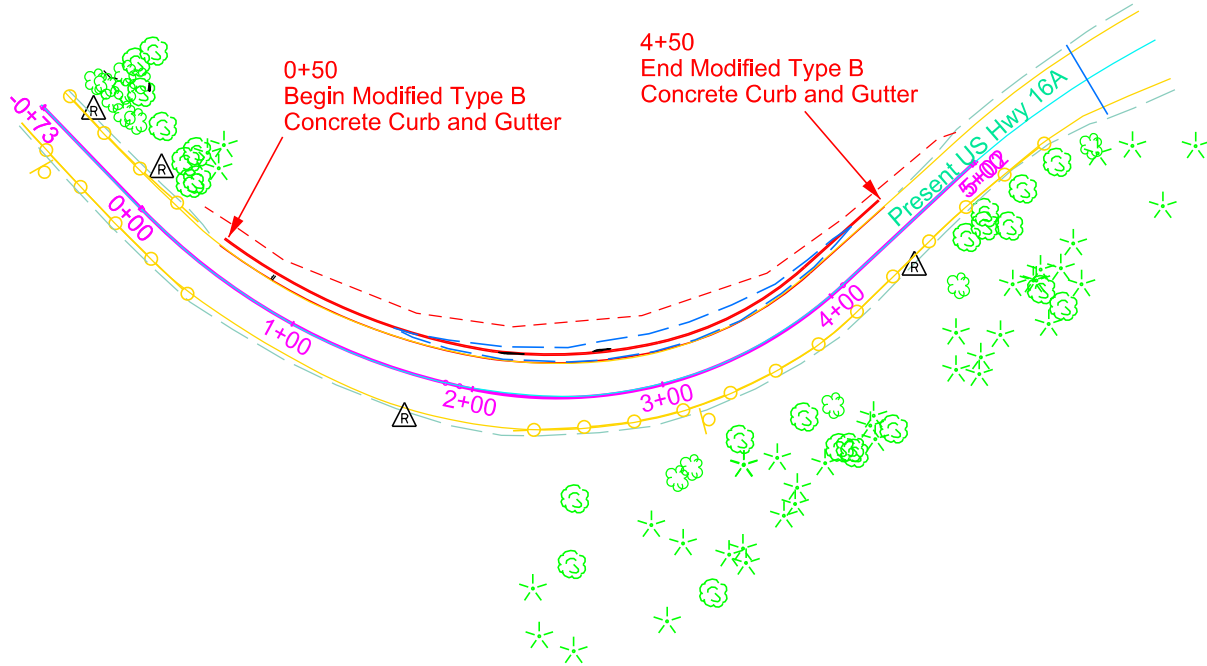
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Plot Scale - 1:100

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STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	016A-491	7	17

Plotting Date: 04/22/2016



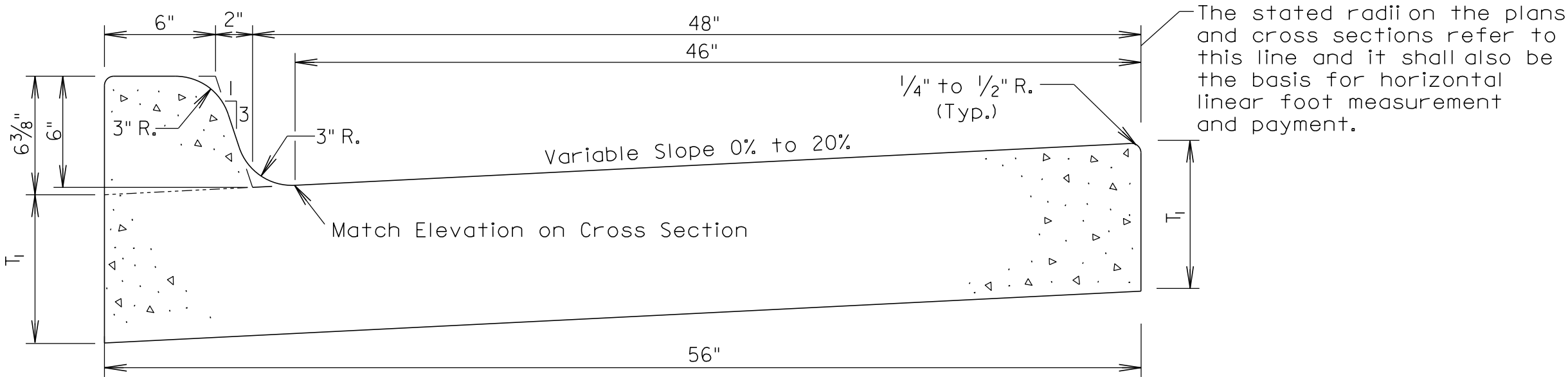
PLOT SCALE - 1+6.25

PLOTTED FROM - TRRC11951

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	016A-491	8	17

Plotting Date: 04/14/2016

MODIFIED TYPE B CONCRETE CURB AND GUTTER



Type	T <sub>1</sub> (Inches)	Cu. Yd. Per Lin. Ft.	Lin. Ft. Per Cu. Yd.
B68	8	0.124	8.1

PLOT NAME - 2

FILE - ... \MODIFIED TYPE B C&G.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.

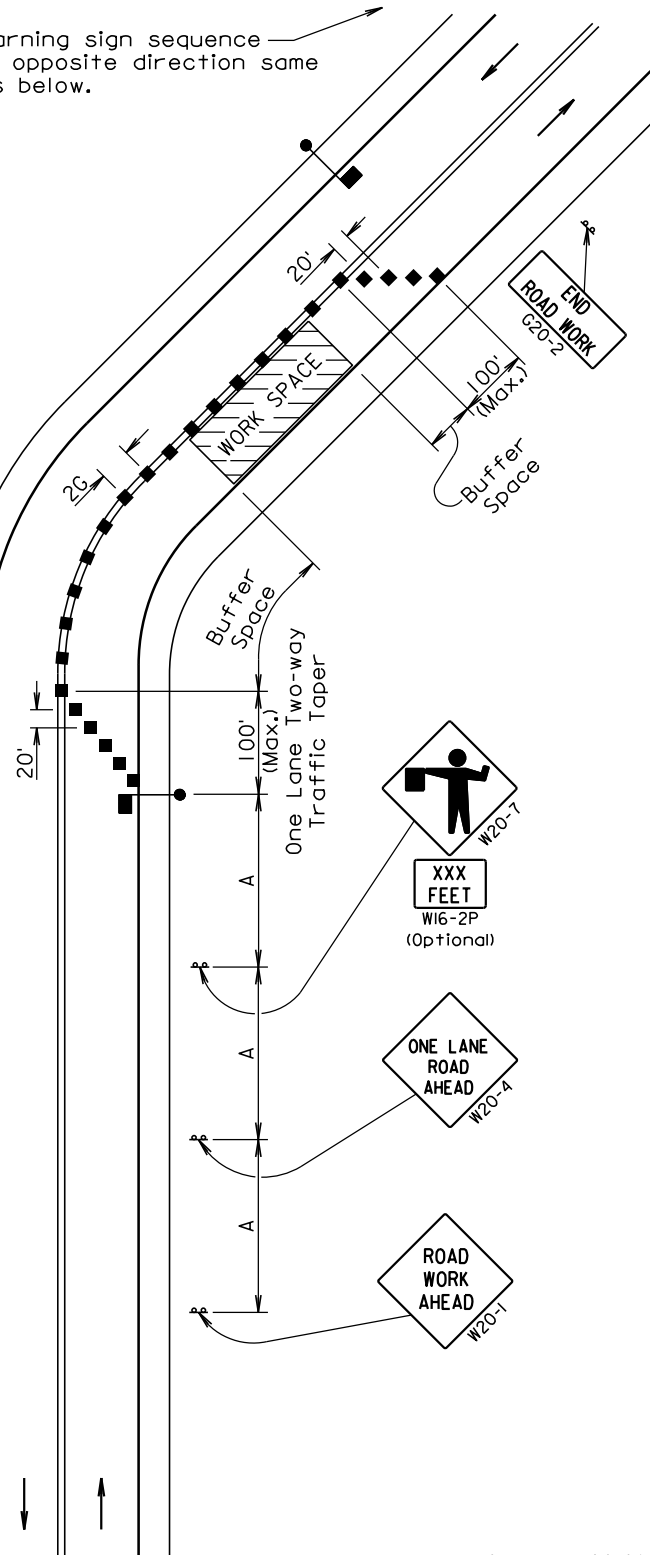
2-029  
ROAD WORK  
END

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.

Warning sign sequence in opposite direction same as below.



September 22, 2014

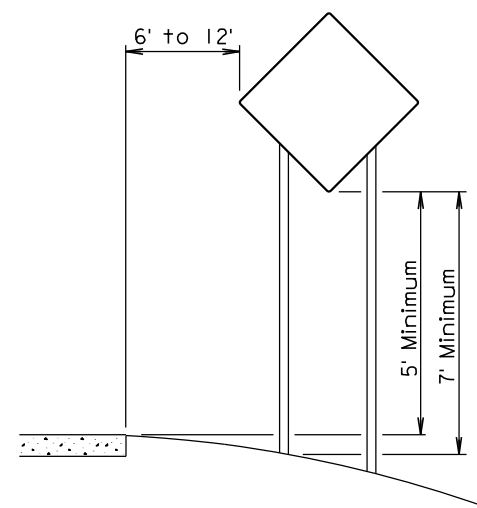
Published Date: 2nd Qtr. 2016

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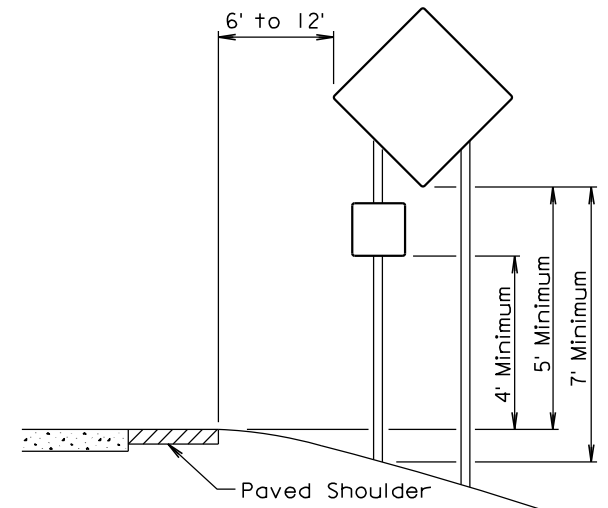
GUIDES FOR TRAFFIC CONTROL DEVICES  
LANE CLOSURE WITH FLAGGER PROVIDED

PLATE NUMBER  
634.23

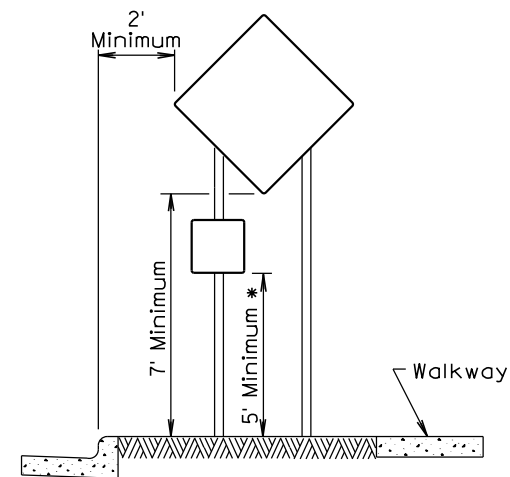
Sheet 1 of 1



RURAL DISTRICT

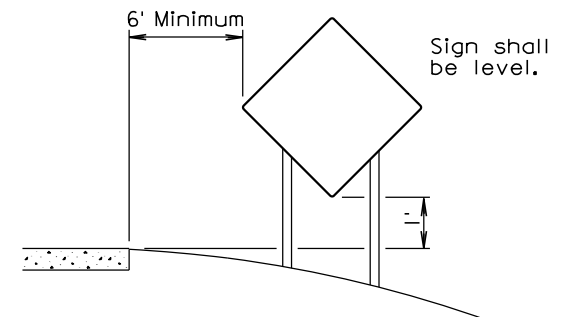


RURAL DISTRICT WITH  
SUPPLEMENTAL PLATE



URBAN DISTRICT

\* 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.



RURAL DISTRICT  
3 DAY MAXIMUM  
(Not applicable to regulatory signs)

September 22, 2014

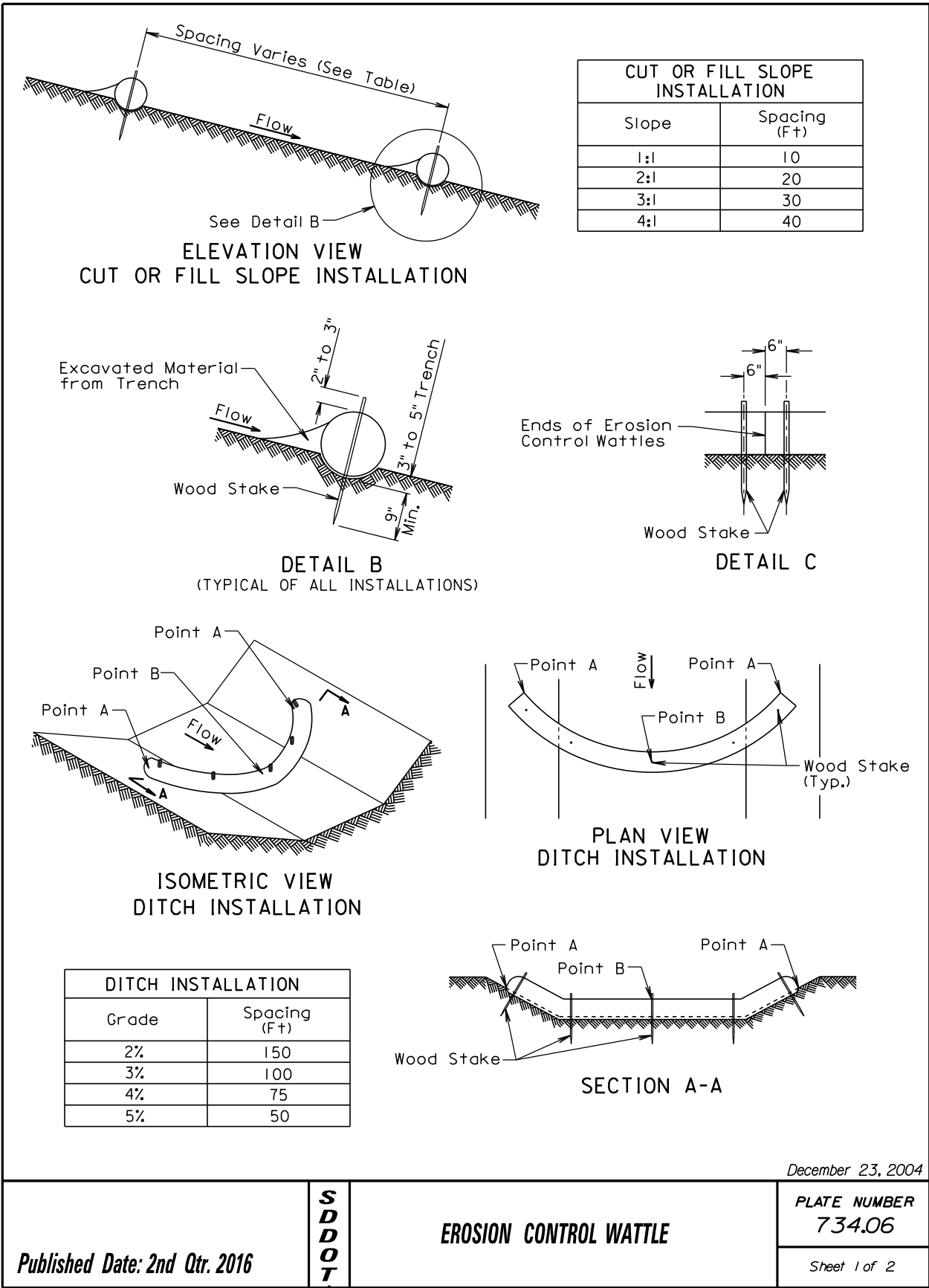
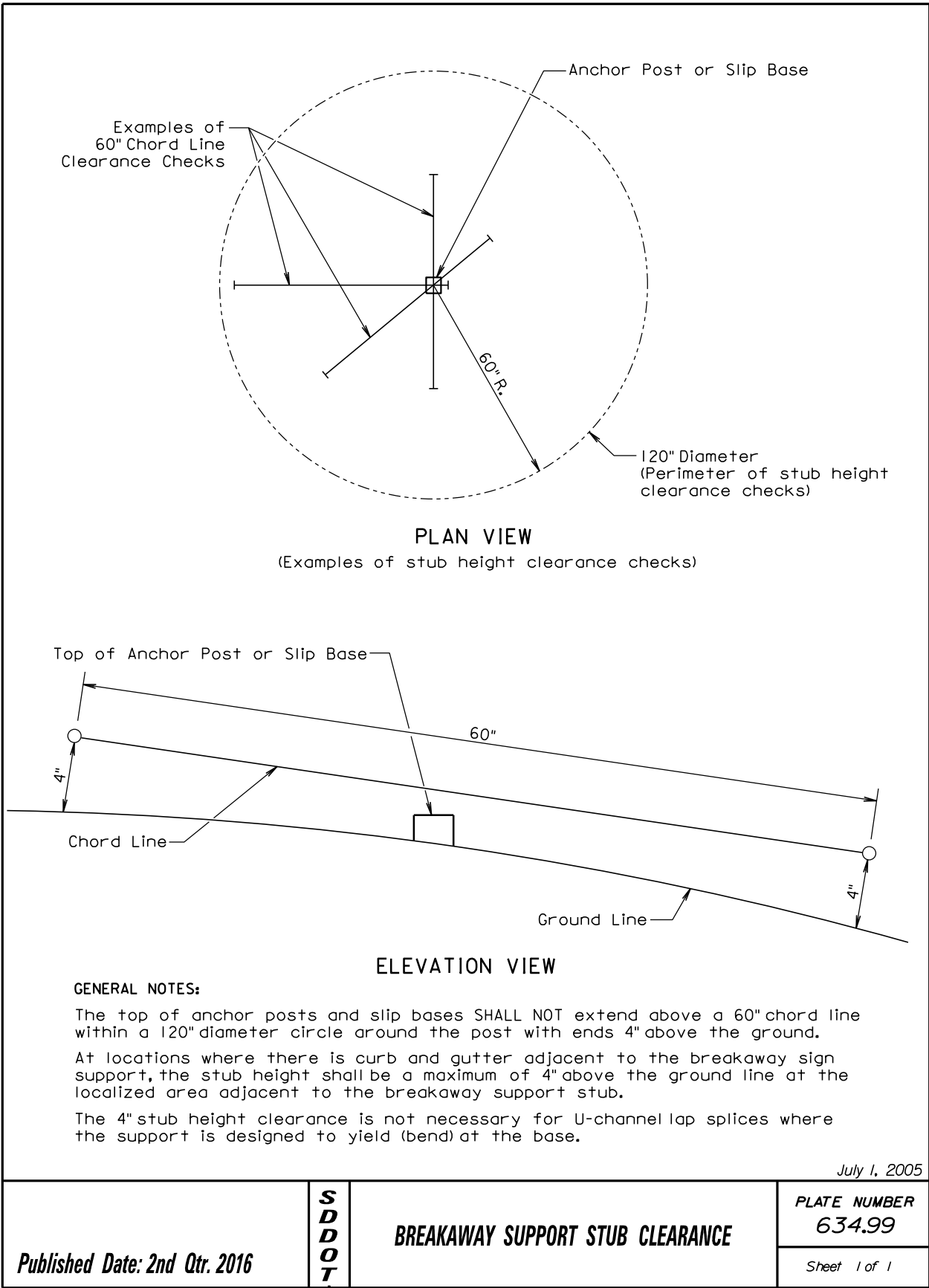
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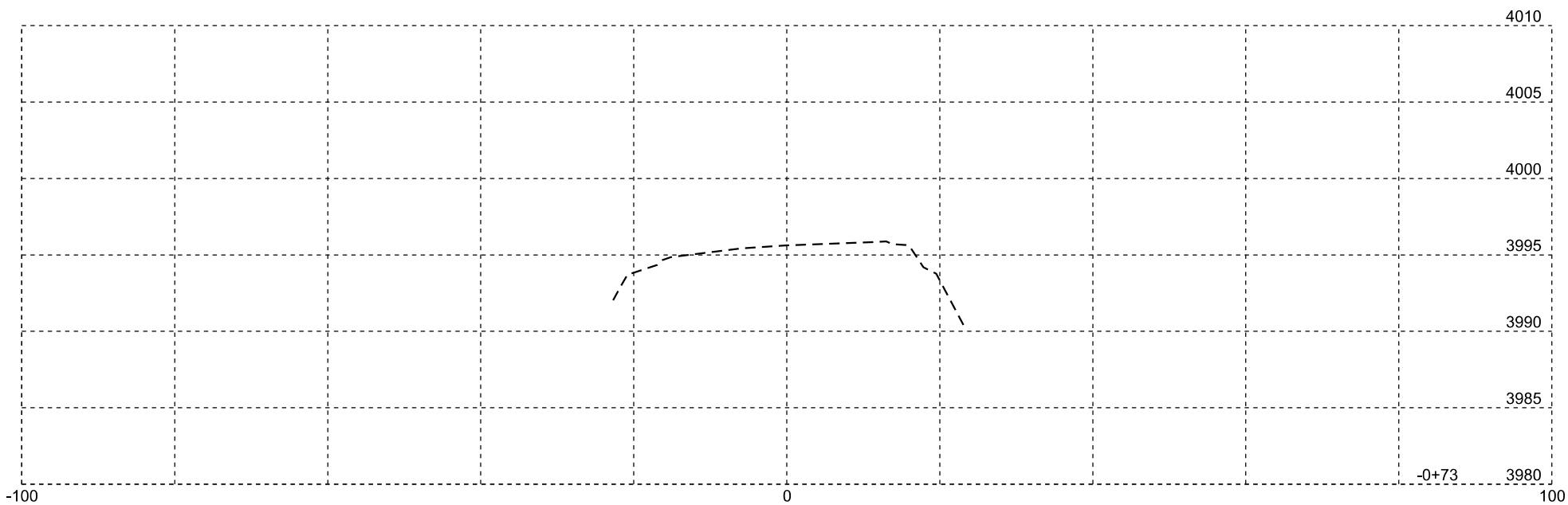
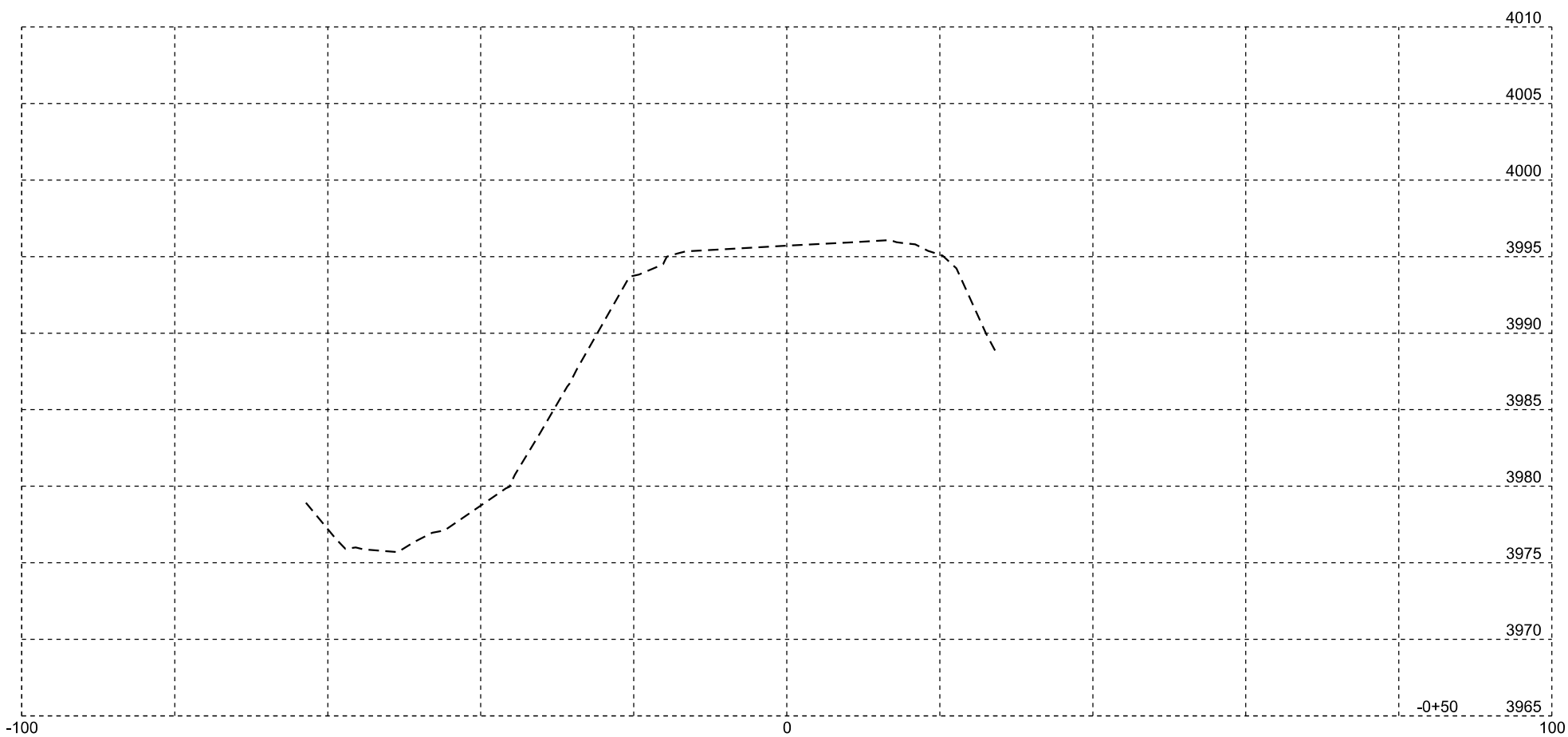
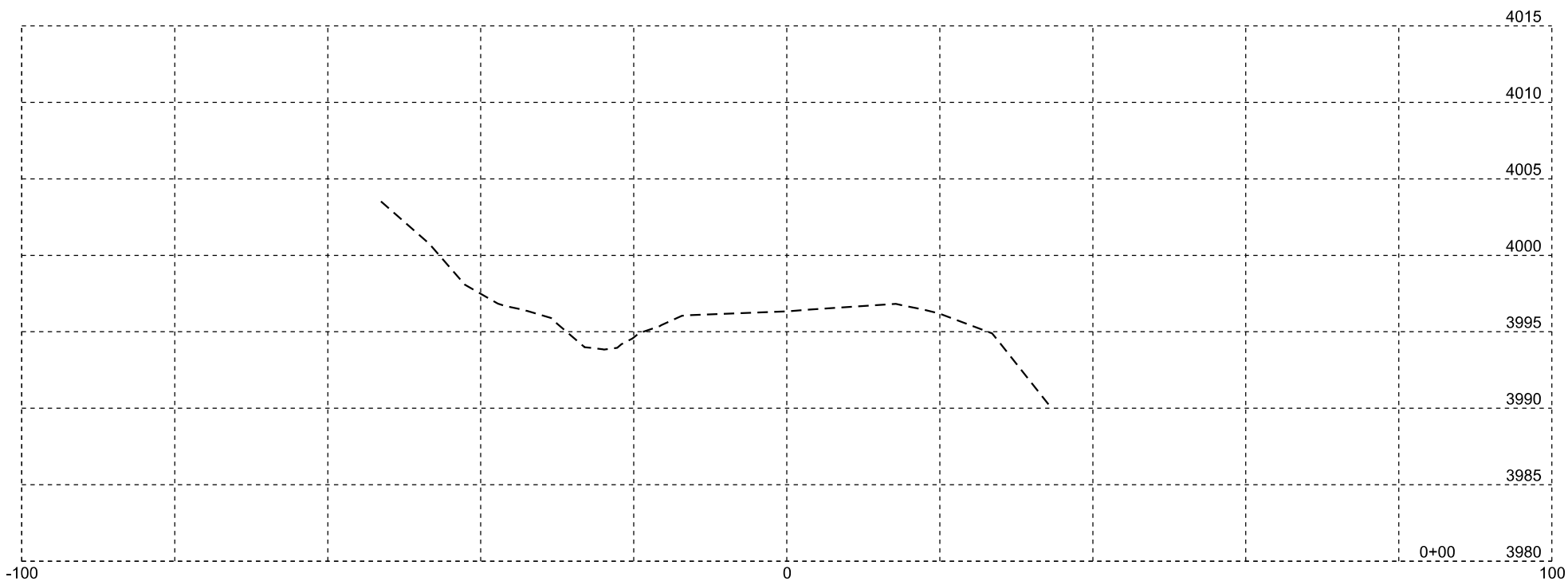
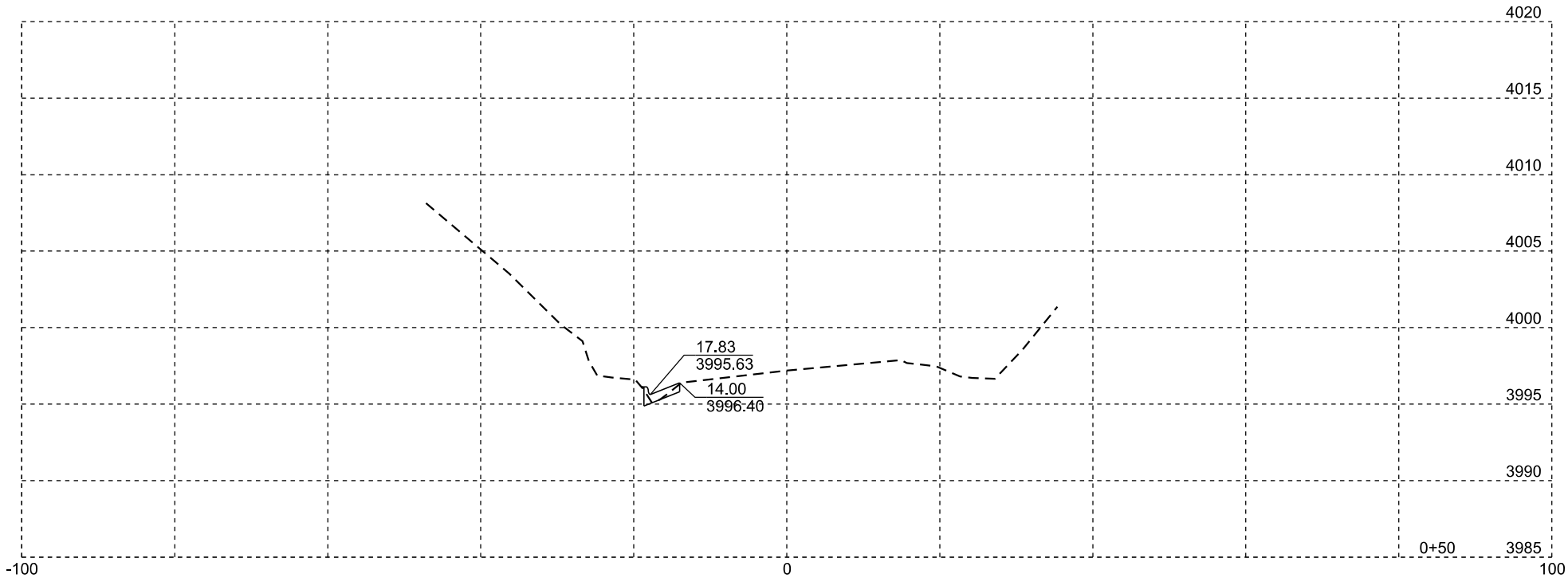
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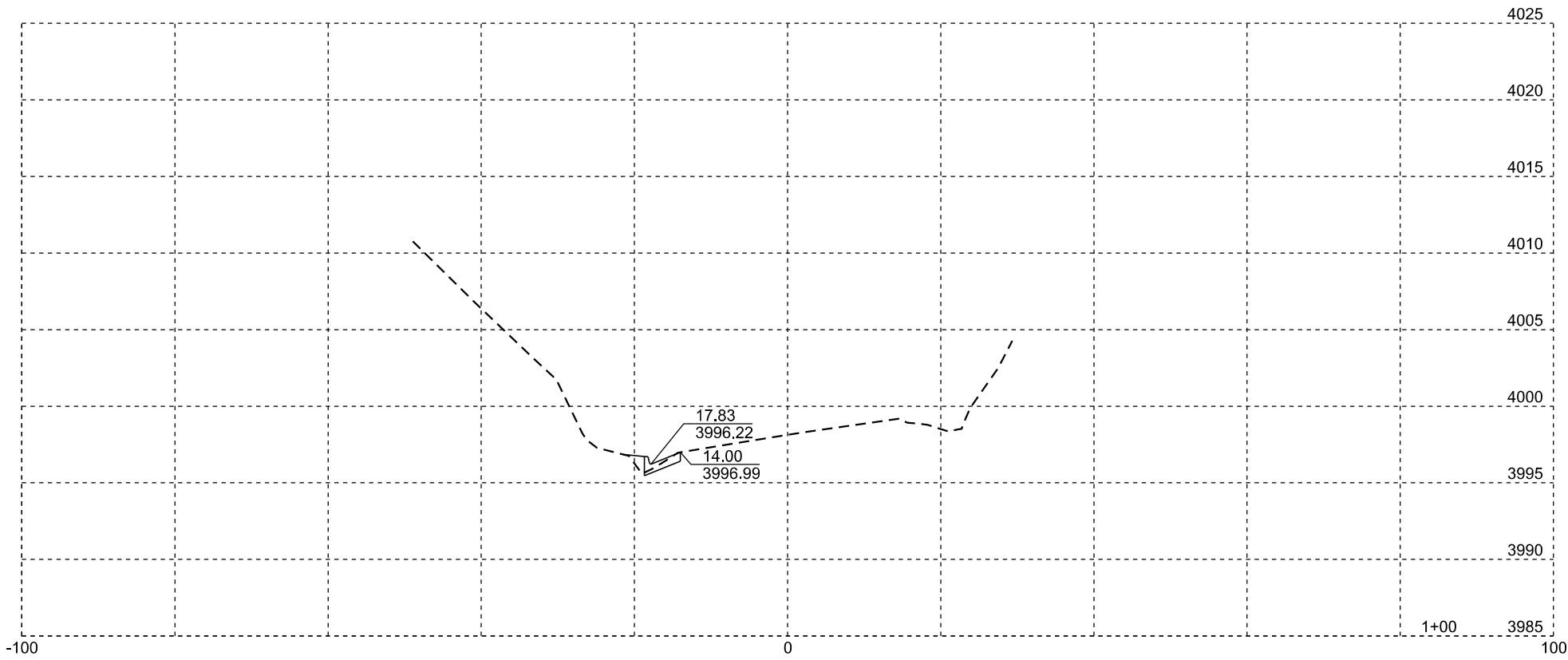
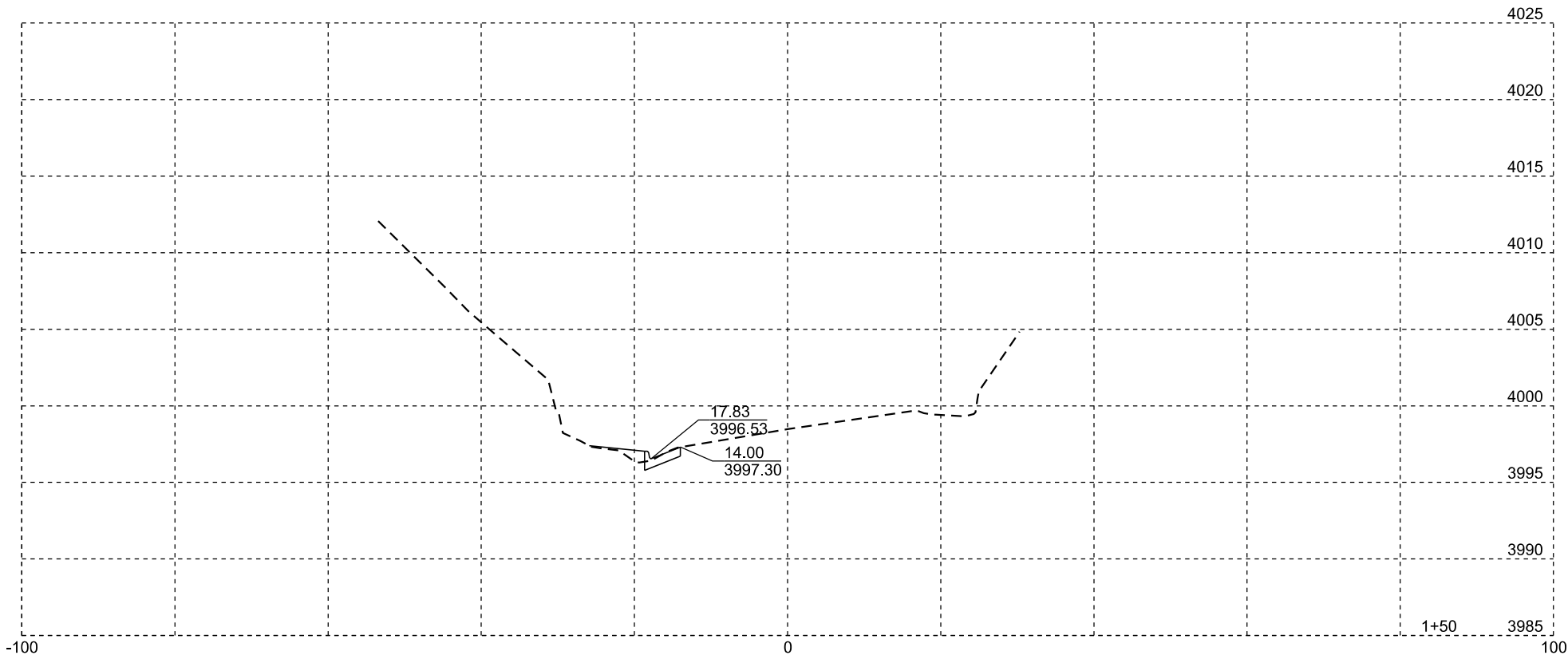
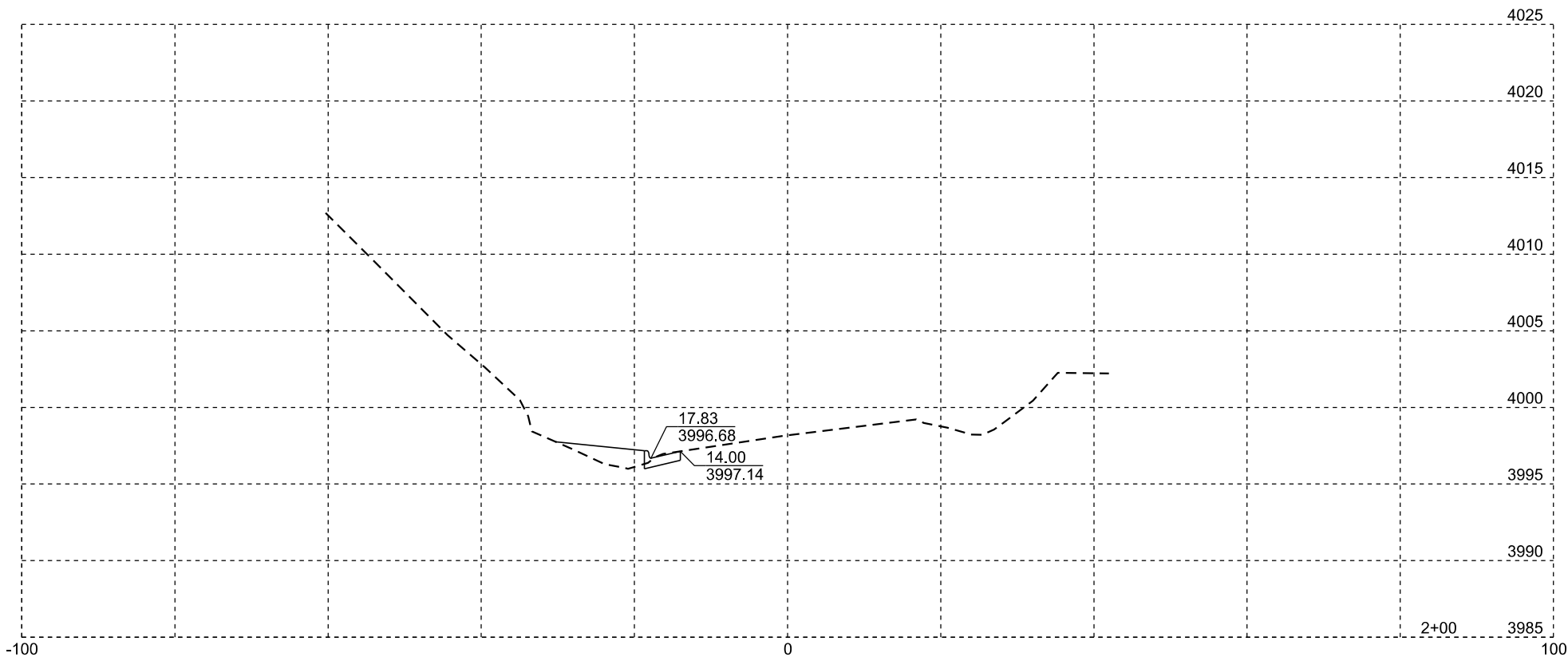
CRASHWORTHY SIGN SUPPORTS  
(Typical Construction Signing)

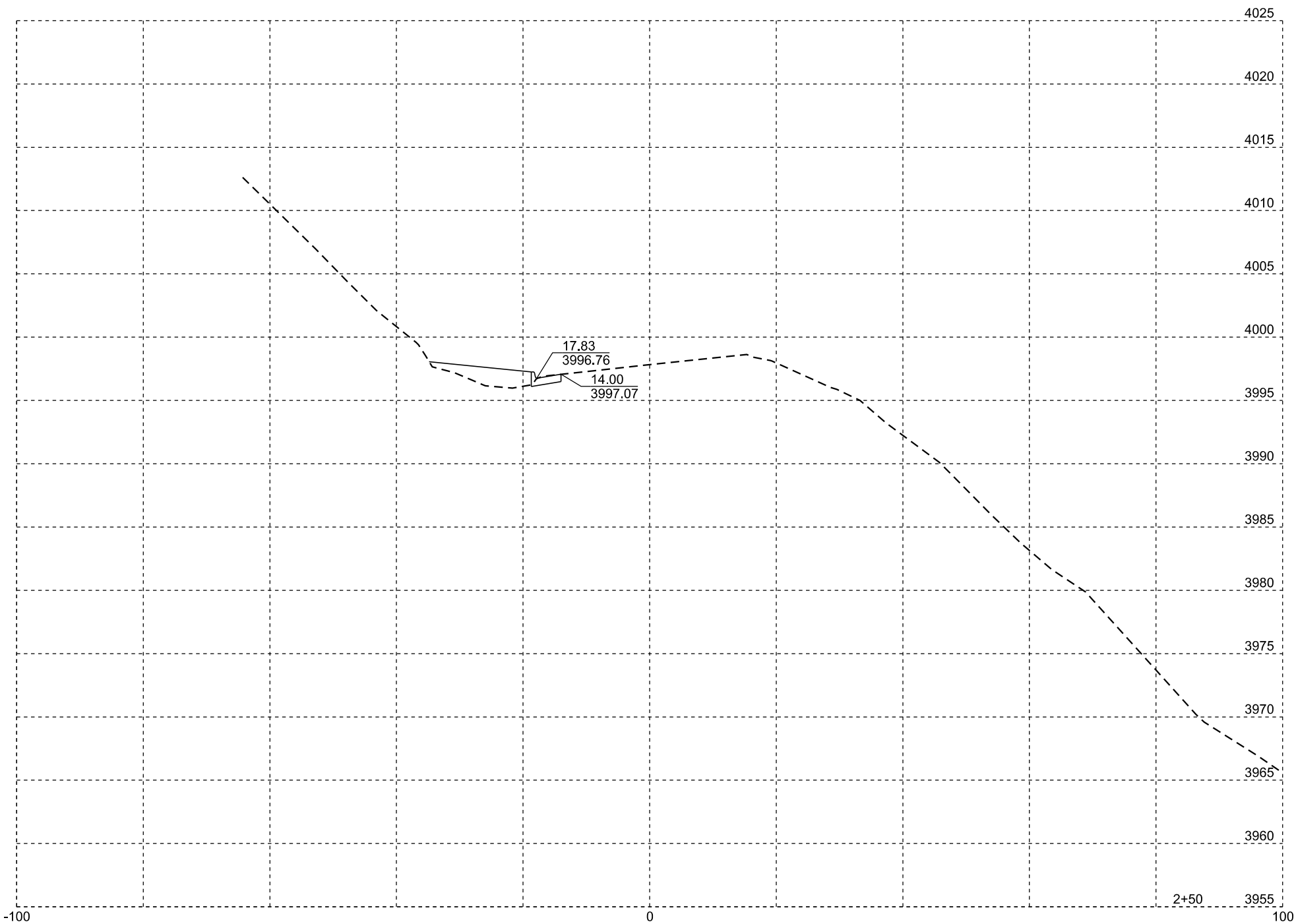
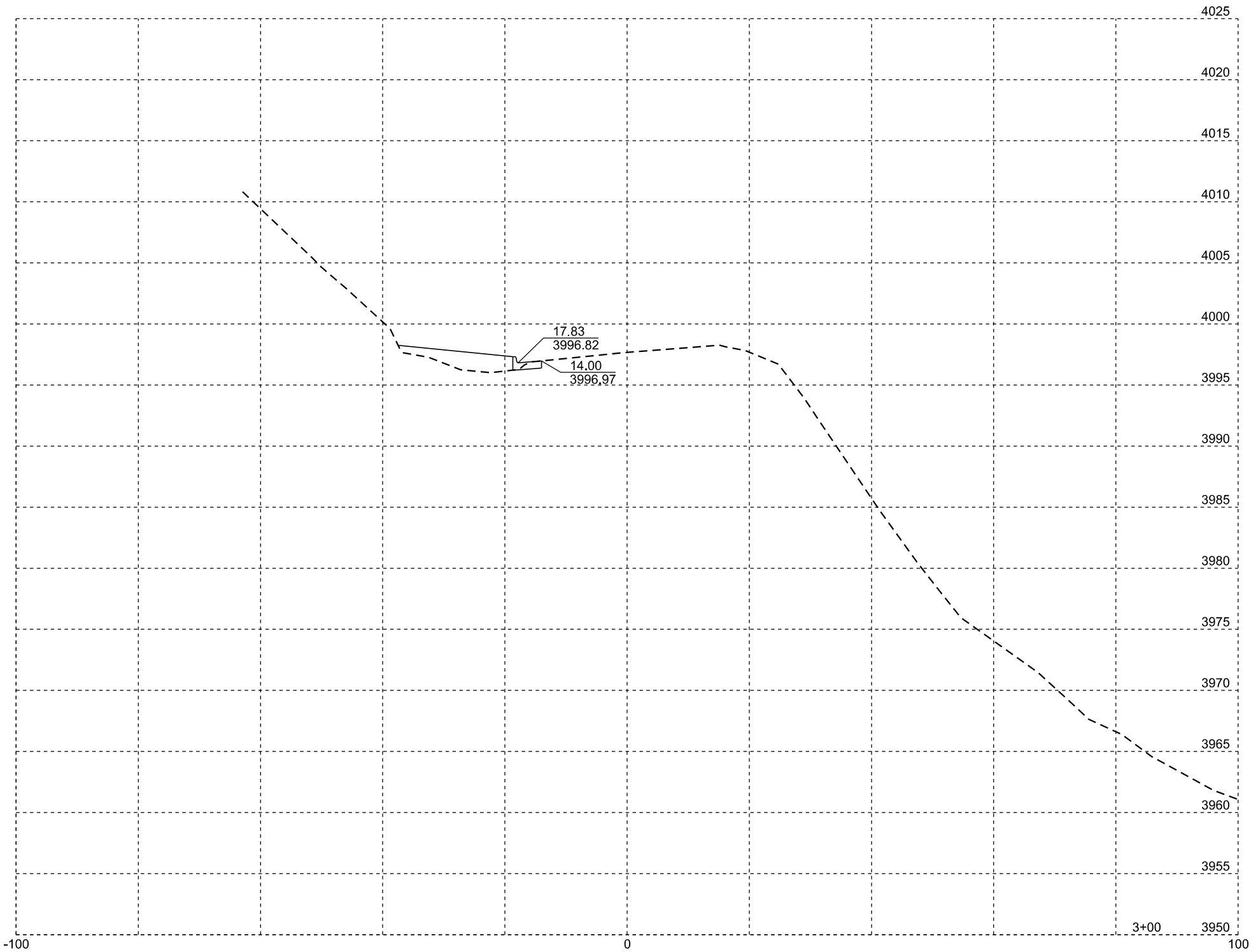
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Sheet 1 of 1



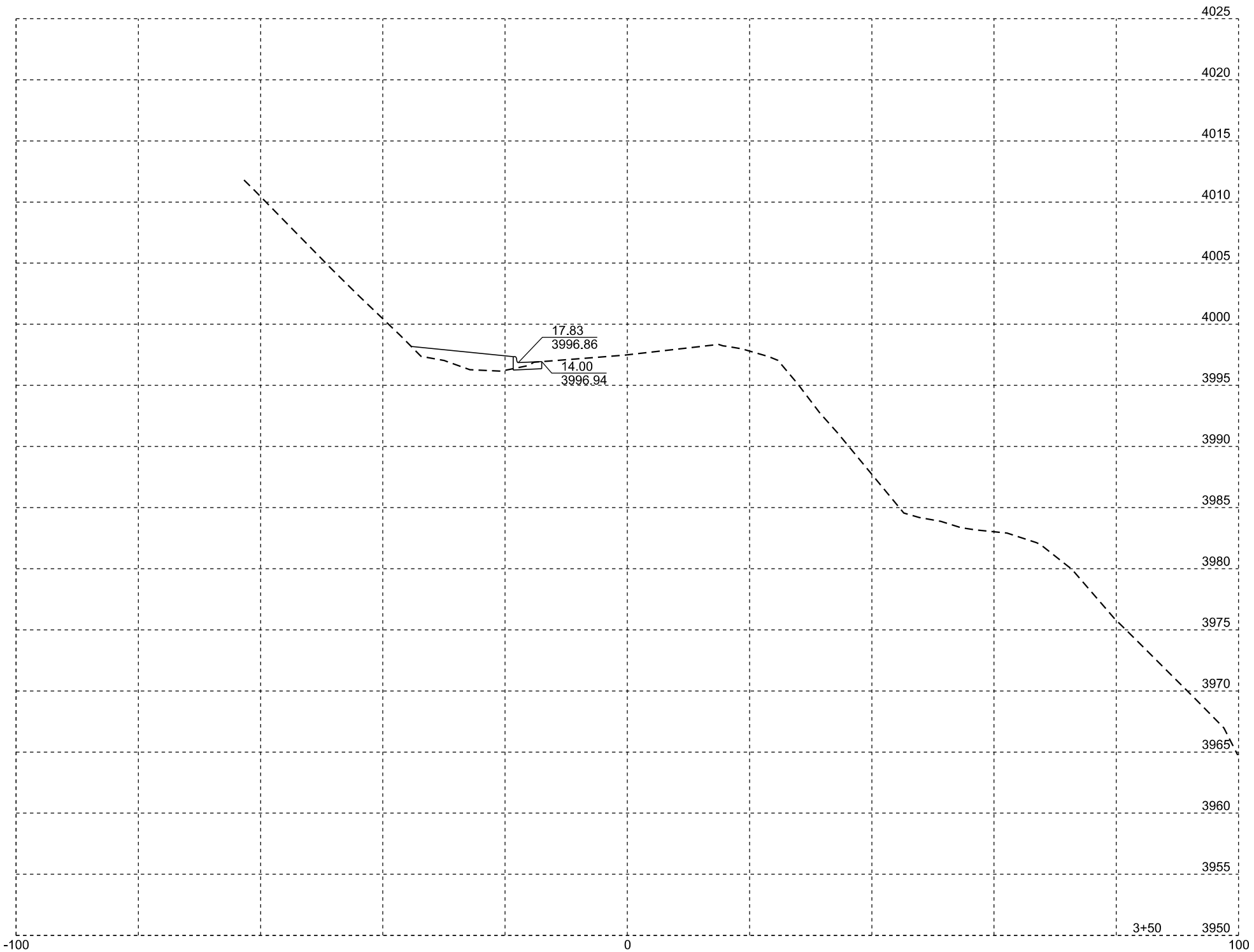






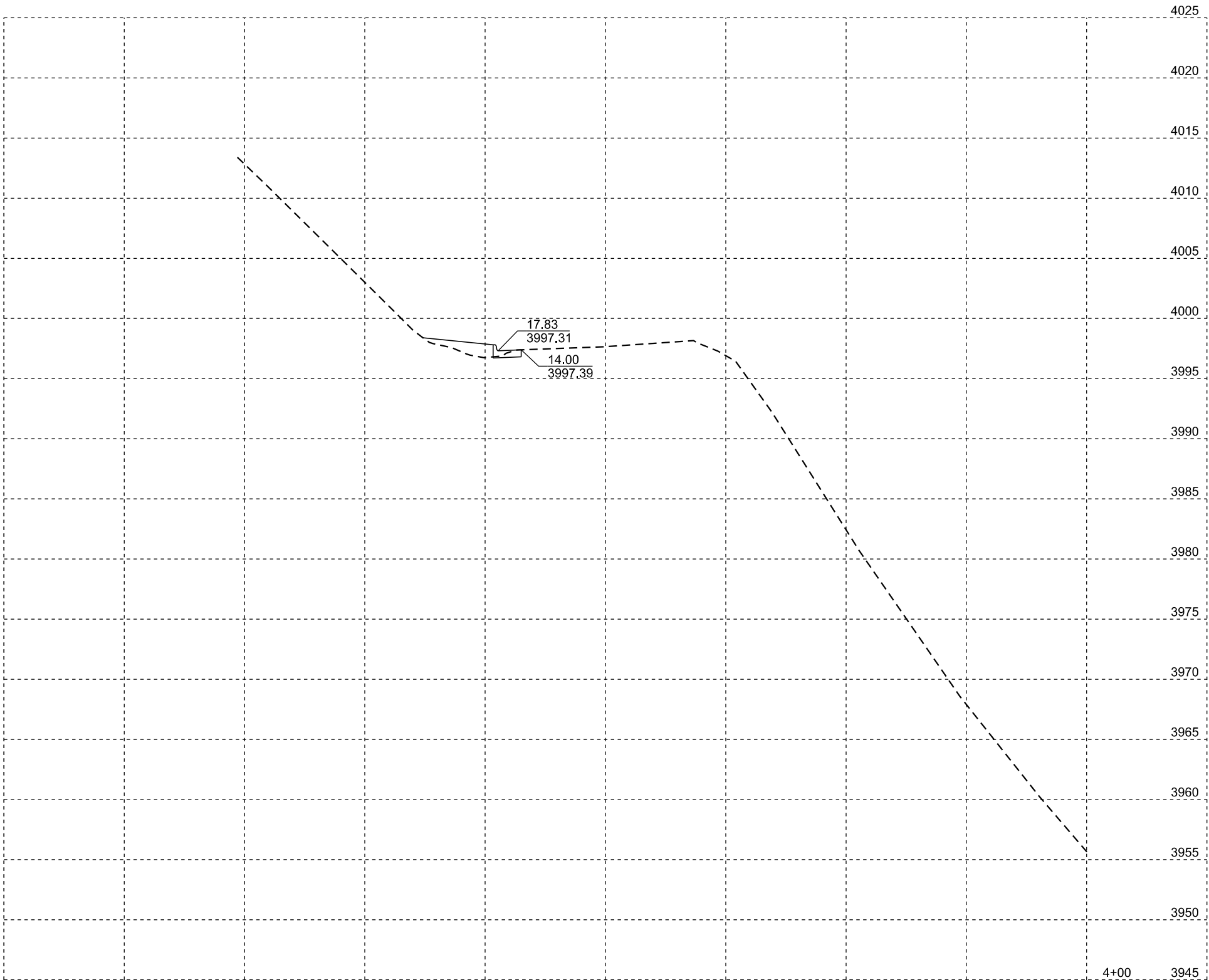
Plotting Date: 04/14/2016

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO. 13	TOTAL SHEETS 17
	016A-491		



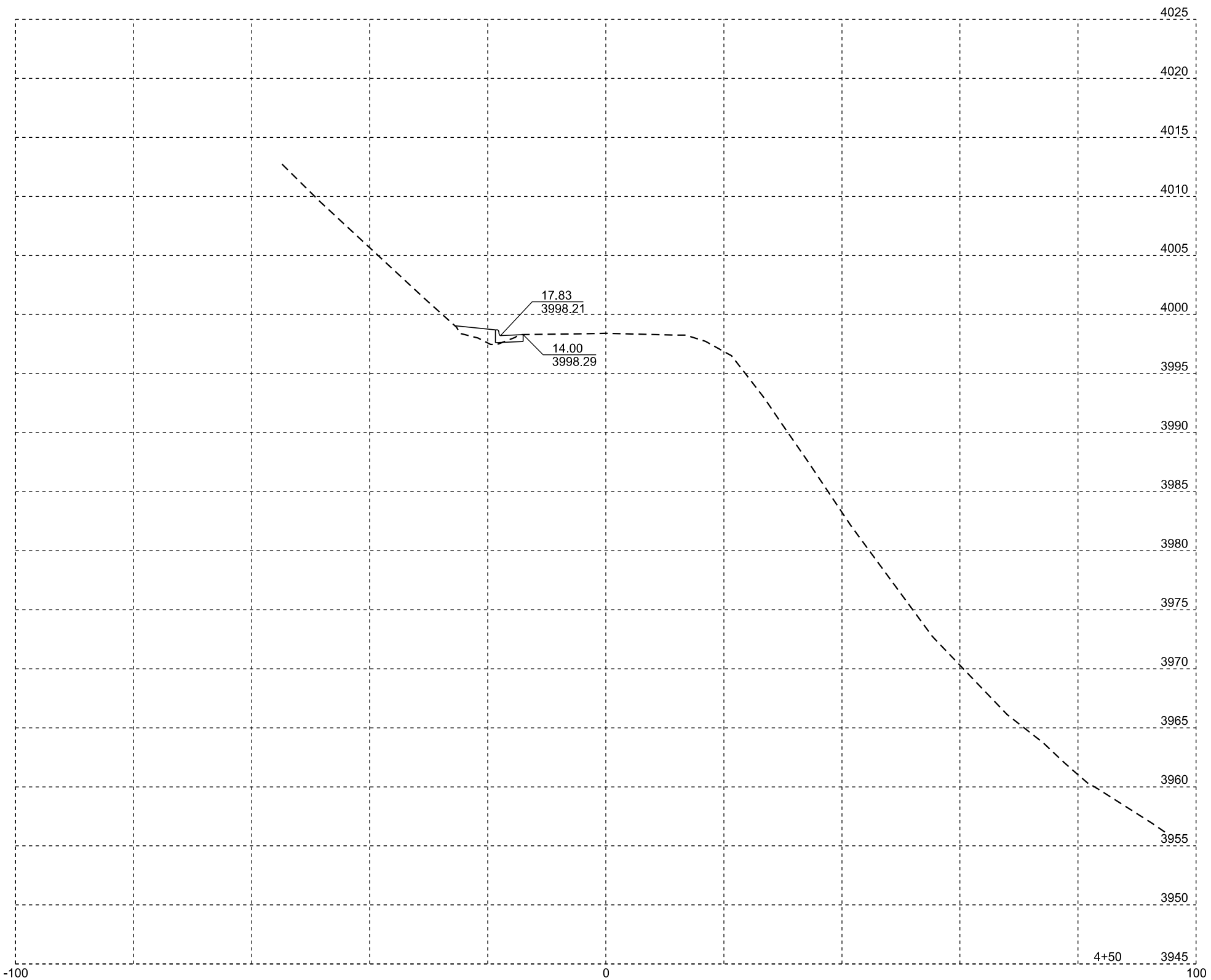
Plotting Date: 04/14/2016

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
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Plotting Date: 04/14/2016

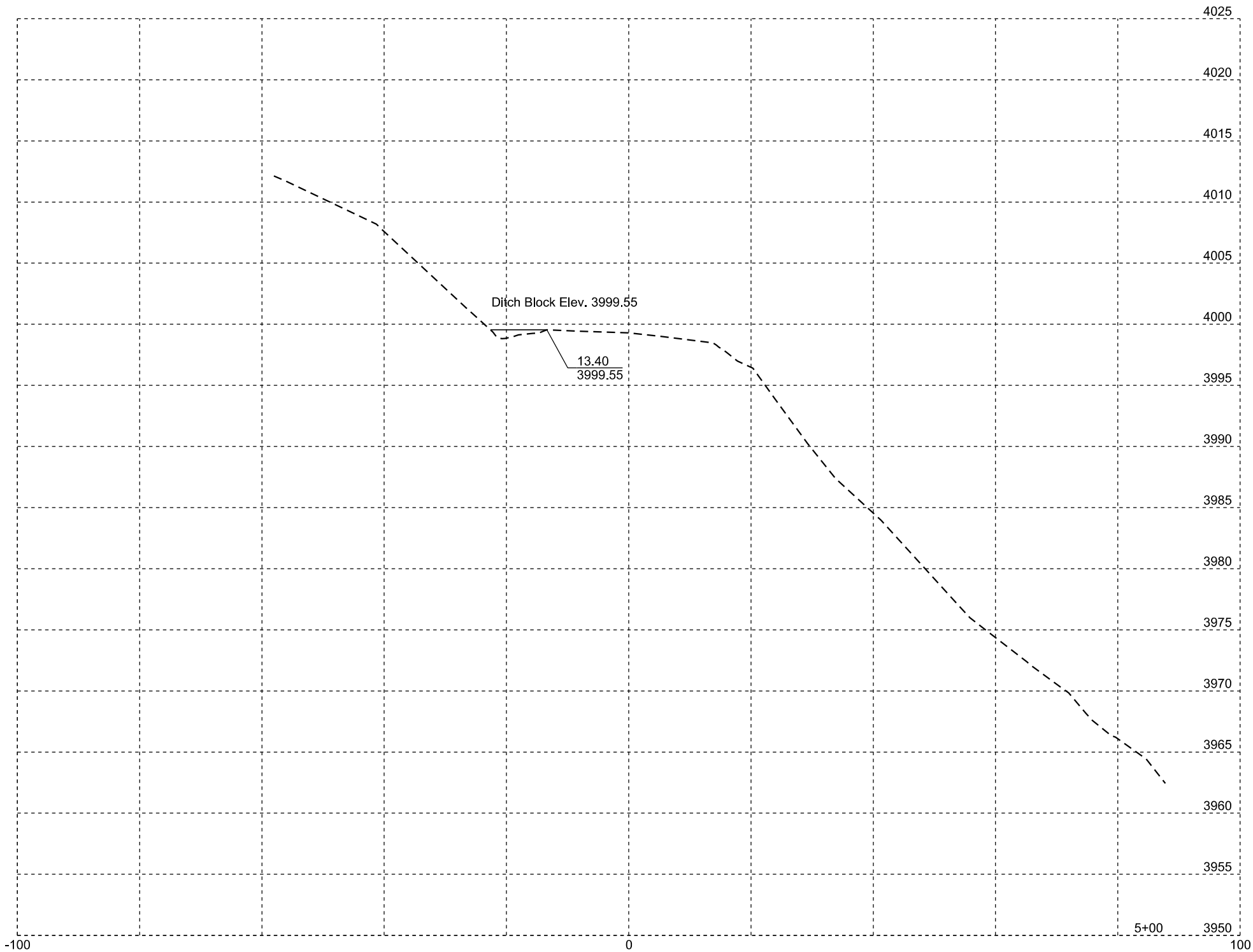
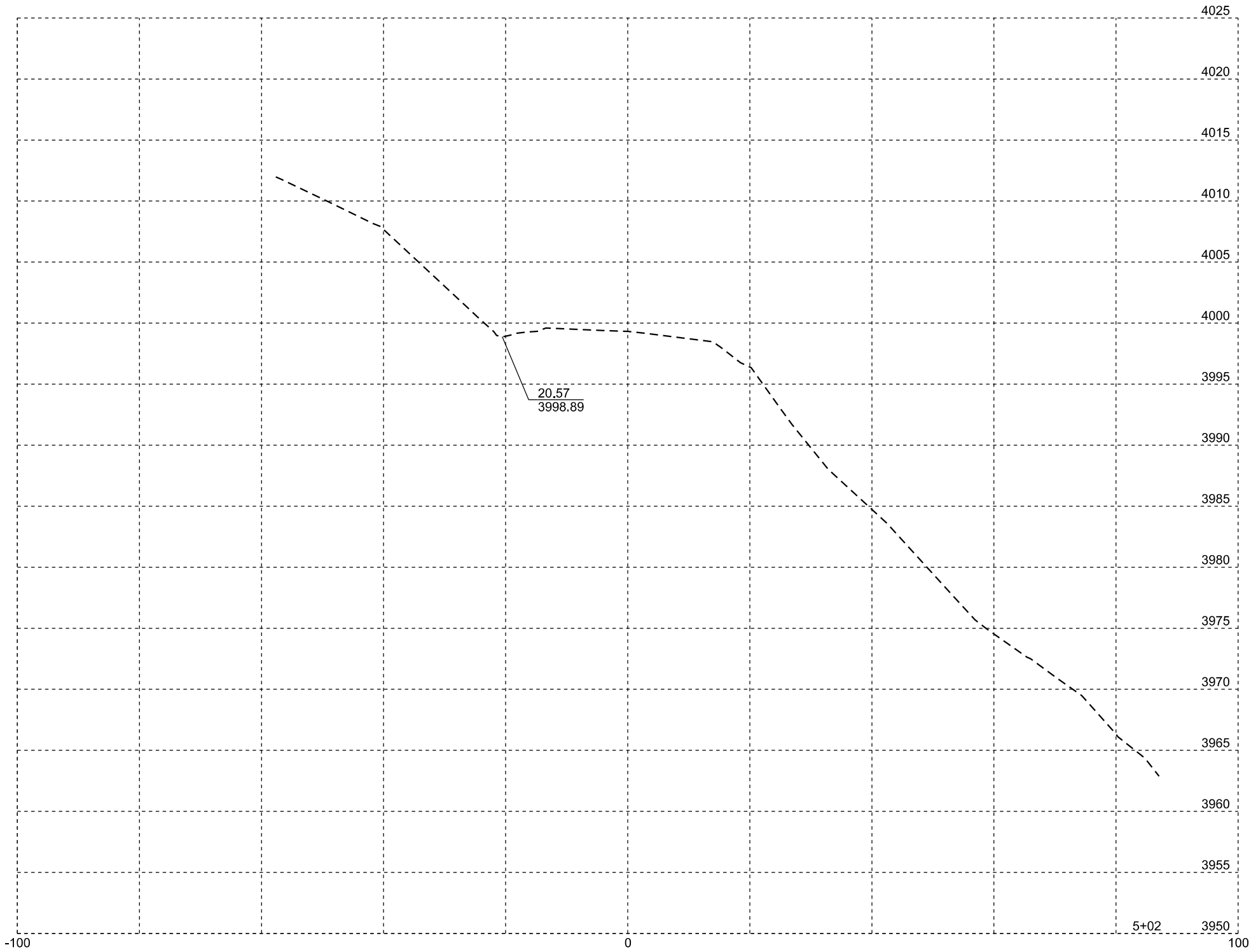
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Plotting Date: 04/14/2016

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO. 16	TOTAL SHEETS 17
	016A-491		





Plotting Date: 04/14/2016

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	016A-491		

17

17