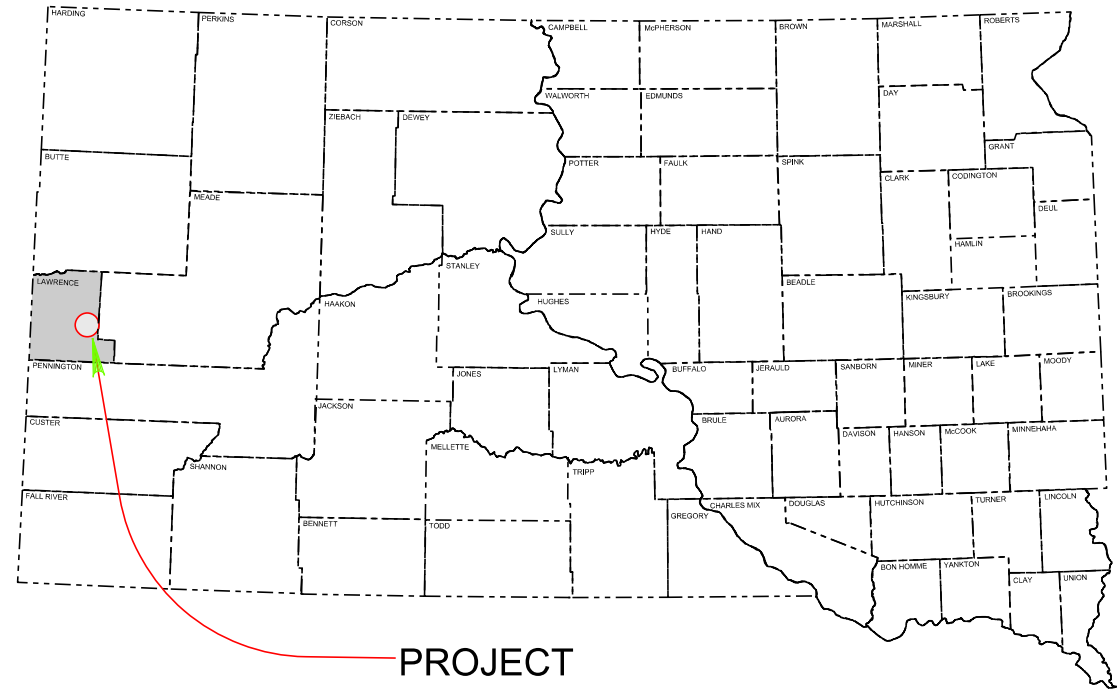


Plot Scale - 1:200



DESIGN DESIGNATION	
ADT (2011)	1260
ADT (2031)	1469
DHV	308.5
D	51 %
T DHV	3.5%
T ADT	7.6 %
V	45 MPH

STORM WATER PERMIT
None Required

SCALES	
PLAN	URBAN 1"=40'
PROFILE,	{ HORIZONTAL: 1"=40' VERTICAL: 1"=10'
CROSS SECTIONS	{ HORIZONTAL: 1"=20' VERTICAL: 1"=10'

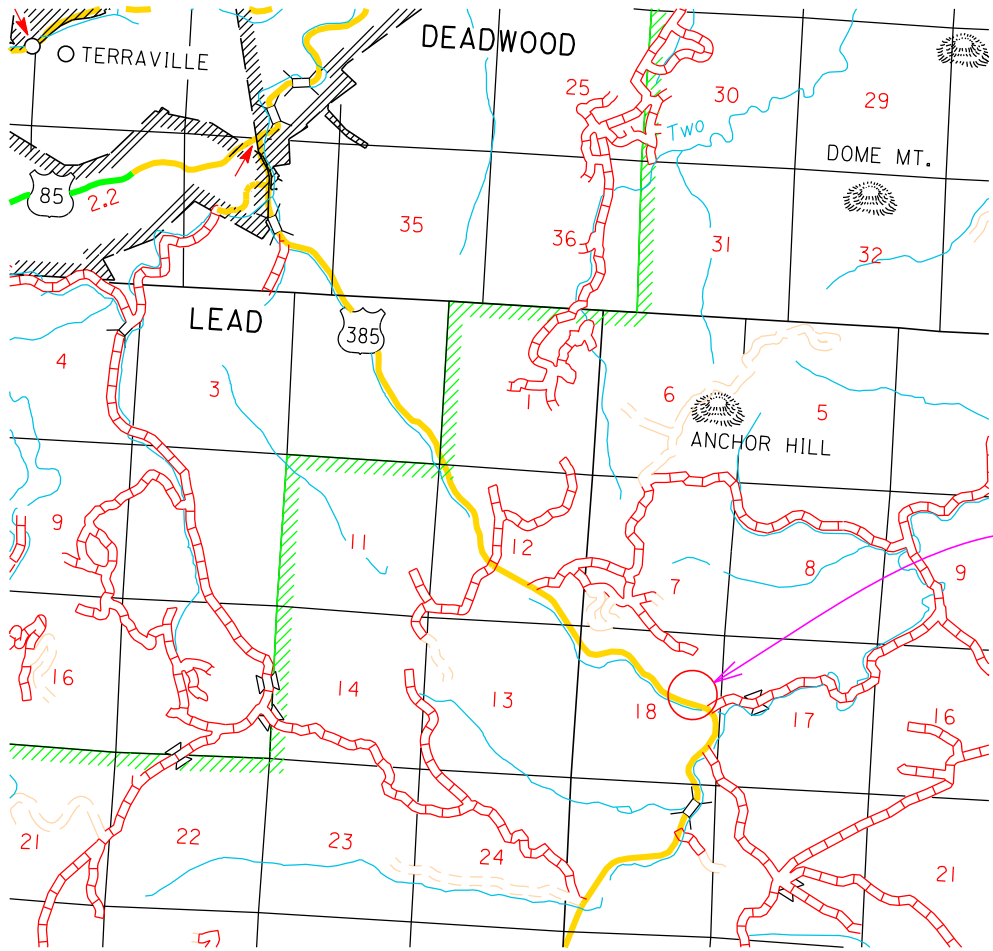
STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED
PROJECT 385-451
US HIGHWAY 385
LAWRENCE COUNTY
RETAINING WALL REPAIR
PCN i2y9

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	385-451	1	25

Plotting Date: 09/03/2013

INDEX OF SHEETS

- 1 General Layout W/Index
- 2-5 Estimate With General Notes & Tables
- 6 Traffic Control
- 7 Control Data
- 8 Horizontal Alignment Data
- 9 Topography Symbolology & Legend
- 10 Plan & Profile Sheet
- 11 - 12 Standard Plates
- 13 - 19 Original Structure Sheets
- 20 - 25 Cross Sections



PROJECT 385-451
Sta 80+25 to Sta 81+80
MRM 116.9 to MRM 117.0



Plotted From - irrc11610

ESTIMATE OF QUANTITIES

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
110E7060	Remove MSE Segmental Modular Wall for Reset	199	SqFt
110E7802	Remove Fence for Reset	36	Ft
120E0600	Contractor Furnished Borrow	27	CuYd
230E0100	Remove and Replace Topsoil	Lump Sum	LS
260E1010	Base Course	10.0	Ton
530E0411	Reset MSE Segmental Block Wall	199	SqFt
620E4100	Reset Fence	36	Ft
634E0010	Flagging	50	Hour
634E0100	Traffic Control	238	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
734E0010	Erosion Control	Lump Sum	LS
734E0154	12" Diameter Erosion Control Wattle	130	Ft

SPECIFICATIONS

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

ENVIRONMENTAL COMMITMENTS

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

COMMITMENT B: FEDERALLY THREATENED, ENDANGERED, AND PROTECTED SPECIES

COMMITMENT B2: WHOOPING CRANE

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

Action Taken/Required:

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

COMMITMENT C: WATER SOURCE

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

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.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	385-451	2	25

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:

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

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

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

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

COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES

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

Action Taken/Required:

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

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

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

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

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

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

COMMITMENT R: FIRE PREVENTION IN THE BLACK HILLS AREA

This project is located within the confines of the Black Hills Forest Fire Protection Boundary.

Action Taken/Required:

The Contractor shall adhere to the "Special Provision for Fire Plan".

SCOPE OF WORK

- 1. Remove and reset portions of the MSE Segmental Modular Wall that is rotating and/or dislodged.
- 2. Place Contractor Furnished Borrow in front of and behind the retaining wall as per the cross sections.
- 3. Remove & Reset split rail fence impacted by Modular Wall work.

LANDOWNER NOTIFICATION

The Contractor shall coordinate with the adjacent landowner (Sylvia Haux 605 578-2820 Home, 605 641-3774 Cell) prior to beginning work.

UTILITIES

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

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

REMOVE MSE SEGMENTAL MODULAR WALL FOR RESET

The Contractor shall remove the sections of the wall for reset as shown on the plan and profile sheet without damaging the reinforcement for the MSE Modular Wall. The granular backfill shall be salvaged and used to reset the MSE Segmental Modular Wall.

It will be the Contractor's responsibility to determine how to remove the cap units and blocks without damage to the block and reinforcement. Any blocks, cap units, or reinforcement damaged during the removal process shall be replaced by the Contractor at no additional cost to the State.

The Contractor shall verify the existing reinforcement was installed as per Sheet 18 of these plans. If the reinforcement is missing it shall be replaced. The extra work associated with replacing reinforcement shall be addressed as per Section 4.3 of the Standard Specifications.

RESET MSE SEGMENTAL MODULAR WALL

Resetting of the wall shall conform to the original wall construction plan procedures found in these plans.

The Contractor shall excavate the minimum amount of material behind the wall to allow for the removal and replacement of the blocks, reinforcement and backfill.

The minimum width of reinforcement required for installation shall be as per the original shop drawings or manufactures specifications. Overlap of the reinforcement is not required and the reinforcement shall be installed perpendicular to the wall as per original shop drawings.

During placement of the blocks the reinforcement will need to be pulled taut, kept level, and pinned or held between blocks.

The backfill shall be compacted to 95% of maximum dry density as determined by SD 104.

TABLE OF REMOVE & RESET MSE SEGMENTAL MODULAR WALL

Station	to	Station	L/R	Quantity (SqFt)
0+00		0+36	R	184
1+21		1+33	R	15
			Total:	199

CONTRACTOR FURNISHED BORROW

The Contractor shall provide a suitable site for Contractor furnished borrow material. The Contractor is responsible for obtaining all required permits and clearances for the borrow site. The borrow material shall be approved by the Engineer. The plans quantity for "Contractor Furnished Borrow" as shown in the Estimate of Quantities will be the basis of payment for this item.

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

WATER FOR GRANULAR MATERIAL

No separate payment will be made for the Water for Granular Material and all costs associated shall be incidental to the various contract items.

BASE COURSE

Base Course shall be furnished by the Contractor.

Included in the Estimate of Quantities is 10 tons of Base Course for areas of the driveway disturbed by the removing and resetting of the MSE Segmental Modular Wall.

Compaction of the Base Course shall be to the satisfaction of the Engineer.

REMOVE AND REPLACE TOPSOIL

Topsoil shall also be salvaged and stockpiled prior to removing wall for reset area(s). Limits of this work, depth of salvage, and stockpile location will be directed by the Engineer. . The Contractor shall minimize the damage to existing vegetation. Following completion of construction, topsoil shall be spread evenly over the disturbed areas.

All cost associated with removing and replacing the topsoil adjacent to the wall that is to be removed and reset shall be incidental to the lump sum price for “Remove and Replace Topsoil”.

EROSION CONTROL

The contract lump sum price for Erosion Control shall include all material, equipment, and labor necessary to seed (including mycorrhizal inoculum), fertilize and fiber mulch all areas disturbed by construction of this project. All cost associated with this work shall be incidental to the contract unit price per Lump Sum for “Erosion Control”.

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 with a minimum of 20,000 live propagules of mycorrhizal fungi per 1,000 square feet. All costs of inoculating the seed shall be incidental to the contract lump sum price for Erosion Control.

The mycorrhizal inoculum shall be from the list 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 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 34 pounds per 1,000 square feet.

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

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

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	385-451	4	25

PERMANENT SEEDING

The areas to be seeded comprise of all disturbed areas within the project limits except for the top of roadways.

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

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

The varieties listed for the seed mixture are preferred varieties.

Native harvest seed will be allowed.

The Contractor shall increase the seeding rate for this seed mixture by 1.5 if seeding is done by hydroseeding.

Type E Permanent Seed Mixture shall consist of the following:

Grass Species	Variety	Pure Live Seed (PLS) (Pounds/1000 SqFt)
Western Wheatgrass	Flintlock, Rodan, Rosana	2.5
Green Needlegrass	Lodorm	1.5
Sideoats Grama	Butte, Killdeer, Pierre, Trailway	1
Blue Grama	Bad River, Willis	1
Canada Wildrye	Mandan	1
Wildflowers		
Dotted Gayfeather (<i>Liatris punctata</i>)		0.25
Black-eyed Susan (<i>Rudbeckia hirta</i>)		0.25
Blue Flax (<i>Linum lewisii</i>)		0.25
Pale Purple Coneflower (<i>Echinacea angustifolia</i>)		0.25
Total:		8

FIBER MULCHING

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	385-451	5	25

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

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.

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

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

TABLE OF FIBER MULCHING

Station	to	Station	L/R	Quantity (Lb)
23+77		25+77	R	35
29+20		32+20	L/R	303
Total:				338

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 until vegetation has been established.

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.

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	Diameter (Inch)	Location	Quantity (Ft)
80+00	R	12	Ditch	30
Additional Quantity:				100
Total:				130

TRAFFIC CONTROL – GENERAL NOTES

1. Requests to deviate from the sequence of operations shall be submitted in writing to the Engineer for review. Approval of an alternate sequence of operations will only be allowed when the proposed changes meet with the Department's intent for traffic control and sequencing of the work. An alternate sequence shall be submitted for review a minimum of one week prior to potential implementation.
2. Unless otherwise stated in these plans, no work will be allowed during hours of darkness. Hours of darkness are defined, as ½ hour after sunset until ½ hour before sunrise.
3. Storage of vehicles and equipment shall be as near the right-of-way as possible. Contractor's employees should mobilize at a location off the right-of-way and arrive at the work sites in a minimum number of vehicles necessary to perform the work. Indiscriminate driving and parking of vehicles within the right-of-way will not be permitted. Any damage of the vegetation, surfacing, embankment, delineators, and existing signs resulting from such indiscriminate use shall be repaired and/or restored by the Contractor, at no expense to the State, and to the satisfaction of the Engineer.
4. Existing guide, route, informational logo, regulatory, and warning signs shall be temporarily reset and maintained during construction. Removing, relocating, covering, salvaging and resetting of existing traffic control devices, including delineation, shall be the responsibility of the Contractor. Non-applicable signing shall be covered or removed during periods of inactivity. Periods of inactivity shall be defined as no work taking place for a period of more than 36 hours. The cost of removing or covering non-applicable signs shall be incidental to the contract lump sum price for, Traffic Control, Miscellaneous.
5. Construction signing mounted on portable supports shall not be used for a duration of more than 3 days, unless approved by the Engineer. Construction signing that remains in the same location for more than 3 days shall be mounted on fixed location, ground mounted, breakaway supports.
6. If inappropriate/conflicting pavement markings exist, the markings shall be removed and replaced with applicable temporary pavement markings when the work duration is more than 3 days. When the work duration is less than 3 days, the channelizing devices in the area where the pavement markings conflict shall be placed at a spacing of ½ G. Pavement marking removals shall be paid for at the contract unit price for Remove Pavement Marking, 4" or equivalent. Temporary pavement marking shall be paid for at the contract unit bid price for Temporary Pavement Marking. The additional channelizing devices shall be incidental to the contract lump sum price for Traffic Control, Miscellaneous.
7. The quantity of Signs paid for will be for the greatest number of installations per sign in place at any one time regardless of the number of set-ups on the project.
8. Any delineators and signs damaged or lost shall be replaced by the Contractor at no cost to the State.
9. All materials and equipment shall be stored a minimum distance of 30' from the traveled way during nonworking hours.

10. The Contractor shall provide documentation that all breakaway sign supports comply with FHWA NCHRP 350 or MASH crash-worthy requirements. The Contractor shall provide installation details at the preconstruction meeting for all breakaway sign support assemblies.
11. The Contractor shall be required to have a person available 24 hour/day, 7 days/week to maintain traffic control devices. The name and cellular telephone number of this individual shall be given to the Engineer at the preconstruction meeting.
12. The Contractor or designated traffic control subcontractor shall make night inspections at the initial set up of traffic control and every week thereafter to ensure the adequacy, legibility and reflectivity of each sign and device. A written summary of each inspection shall be given to the Engineer within 24 hours after completion of the inspection. The cost for the nighttime inspection work shall be incidental to the contract lump sum price for Traffic Control, Miscellaneous.
13. Vehicles working in traffic or alongside traffic shall be equipped with a flashing amber light visible from all directions. The amber light shall be mounted on the uppermost part of the contractor's vehicle. Lights must have peak intensity within the range of 40 to 400 candelas and must flash at 75 ± 15 flashes per minute. Vehicle flasher/hazard lights are not acceptable. All haul trucks shall be equipped with a second flashing amber light that is visible from the backside of the haul truck. The costs for the flashing amber lights shall be incidental to the various related contract bid items.
14. All construction operations shall be conducted in the general direction of traffic movement.
15. 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.
16. Temporary Road Markers shall be used for lane closure tapers or lane shift tapers. Temporary Road Markers used for tapers and shifts will not be measured for payment and will be incidental to the contract lump sum price for Traffic Control, Miscellaneous.
17. Drums are required in all lane closure tapers.

TABLE OF TRAFFIC CONTROL DEVICES

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
G20-2	36" x 18"	END ROAD WORK	2	17	34
W20-1	48" x 48"	ROAD WORK ##### FT. OR AHEAD	2	34	68
W20-7a	48" x 48"	FLAGGER	2	34	68
W21-5	48" x 48"	SHOULDER WORK	2	34	68
TOTAL UNITS					238

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CONTROL DATA

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Plotting Date: 09/03/2013

HORIZONTAL AND VERTICAL CONTROL POINTS						
POINT	STATION	OFFSET	DESCRIPTION	NORTHING	EASTING	ELEVATION
ML105	85+11.50	21.29 R	REFERENCE MARK	194833.071	1005363.254	5275.72

The coordinates shown on this sheet are based on the South Dakota State Plane Coordinate System.
North Zone (NAD 83/2011) SF = 1.00000000
The elevations shown on this sheet are based on NAVD 88.

1:200
Plot Scale -
trc11610
Plotted From -

HORIZONTAL ALIGNMENT DATA

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
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Plotting Date: 09/03/2013

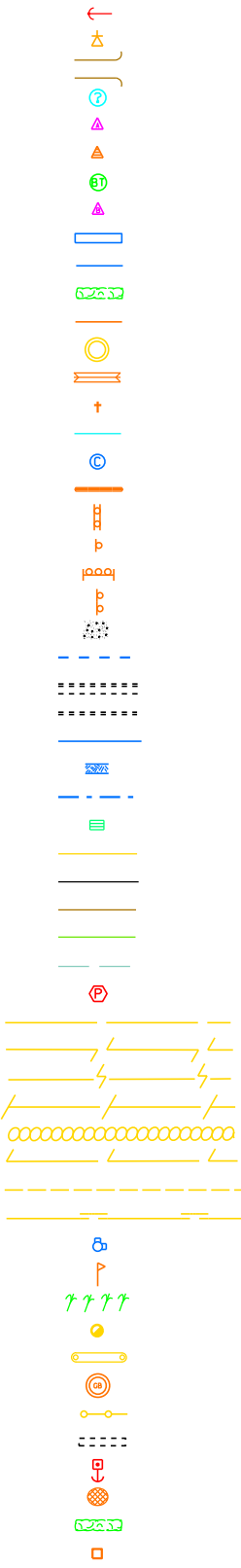
MAINLINE

Type	Station			Northing	Easting
POB	77+41.88			194574.244	1006086.261
		TL= 66.16	N 75°06'11" W		
PC	78+08.04			194591.251	1006022.330
PI	82+77.63	R = 5729.58	Delta = 9°22'15" R	194711.974	1005568.522
PT	87+45.12			194904.977	1005140.427
		TL= 202.25	N 65°43'56" W		
POE	89+47.37			194988.102	1004956.051

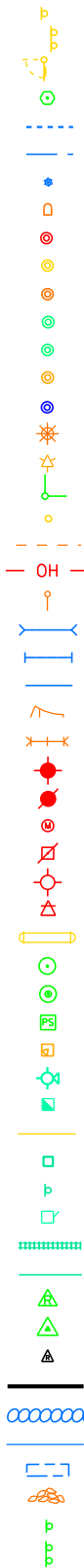
The coordinates shown on this sheet are based on the South Dakota State Plane Coordinate System. North Zone (NAD 83/2011) SF = 1.000000000

EXISTING TOPOGRAPHY SYMBOLOGY AND LEGEND

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
Ditch Block
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
Gutter
Guy Pole
Haystack
Hedge
Highway R.O.W. Marker

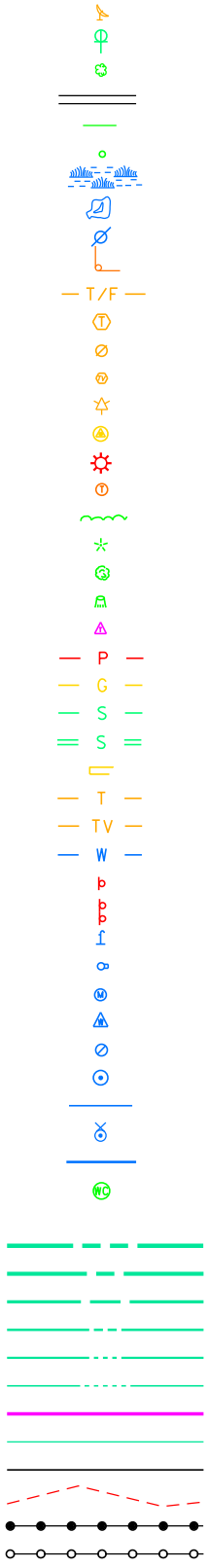


Information Sign One Post
Information Sign Two Post
Interstate Close Gate
Iron Pin
Irrigation Ditch
Lake Edge
Lawn Sprinkler
Mailbox
Manhole Electric
Manhole Gas
Manhole Misc
Manhole Sanitary Sewer
Manhole Storm Sewer
Manhole Telephone
Manhole Water
Merry-Go-Round
Microwave Radio Tower
Misc. Property Corner
Misc. Post
Overhang Or Encroachment
Overhead Utility Line
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
Retaining Wall
Riprap
River Edge
Rock And Wire Baskets
Rockpiles
Route Sign One Post
Route Sign Two Post



Satellite Dish
Septic Tank
Shrub Tree
Sidewalk
Sign Face
Sign Post
Slough Or Marsh
Spring
Stream Gauge
Street Marker
Telephone Fiber Optics
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
Underground Gas Line
Underground Sanitary Sewer
Underground Storm Sewer
Underground Tank
Underground Telephone Line
Underground Television Cable
Underground Water Line
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





STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	385-451	10	25

Plotting Date: 09/03/2013



Remove & Reset MSE Segmental Block Wall
at the following locations:
0+00 R to 0+36 R (184 Sq Ft)
1+21 R to 1+33 R (15 Sq Ft)

Remove & Reset Fence
at the following locations:
80+35 R to 80+70 R
81+55 R to 81+68 R

Sta 1+33 MSE Wall =
Sta 81+67- 34'R

Remove & Reset
Fence (12')

Remove & Reset
Fence (24')

PI 82+77.63
N 194711.97
E 1005568.52
Del 9°22'15"R
Dc 1°00'00"
T 469.59'
L 937.09'
R 5729.58'

Sta 0+00 MSE Wall =
Sta 80+34 - 40'R

79+50± Existing
Underdrain Outlet

Erosion Control Wattle

2+00

1+00

0+00

5280

5280

5275

5275

5270

5270

5265

5265

5260

5260

5255

5255

5250

5250

5245

5245

5240

5240

PVI 0+71
Elev 5255.00

PVI 0+00
Elev 5255.00

12'

11'

Remove & Reset (15 Sq Ft)
MSE Segmental Block Wall

Remove & Reset (184 Sq Ft.)
MSE Segmental Block Wall

Existing Ground
in front of wall

0.0000%

Contractor Furnished
Borrow Elevation in
front of wall
(see Cross Sections)

20'

Plot Scale -
1:40

Plotted From -
trc11610

File - ...lawr12y9 US 385 wallplan.dgn

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

■ Channelizing Device

END ROAD WORK
G20-2

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

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

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

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

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

WORK SPACE

SHOULDER WORK
W21-5

ROAD WORK AHEAD
W20-1

END ROAD WORK
G20-2

February 14, 2011

**S
D
D
O
T**

**GUIDES FOR TRAFFIC CONTROL DEVICES
WORK ON SHOULDERS**

Published Date: 3rd Qtr. 2013

PLATE NUMBER
634.03

Sheet 1 of 1

6' to 12'

5' Minimum

7' Minimum

6' Minimum

4' Minimum

5' Minimum

7' Minimum

Paved Shoulder

RURAL DISTRICT

RURAL DISTRICT WITH SUPPLEMENTAL PLATE

2' Minimum

7' Minimum

Walkway

6' Minimum

Level the Sign

URBAN DISTRICT

RURAL DISTRICT 3 DAY MAXIMUM

February 14, 2011

**S
D
D
O
T**

**CRASHWORTHY SIGN SUPPORTS
(Typical Construction Signing)**

Published Date: 3rd Qtr. 2013

PLATE NUMBER
634.85

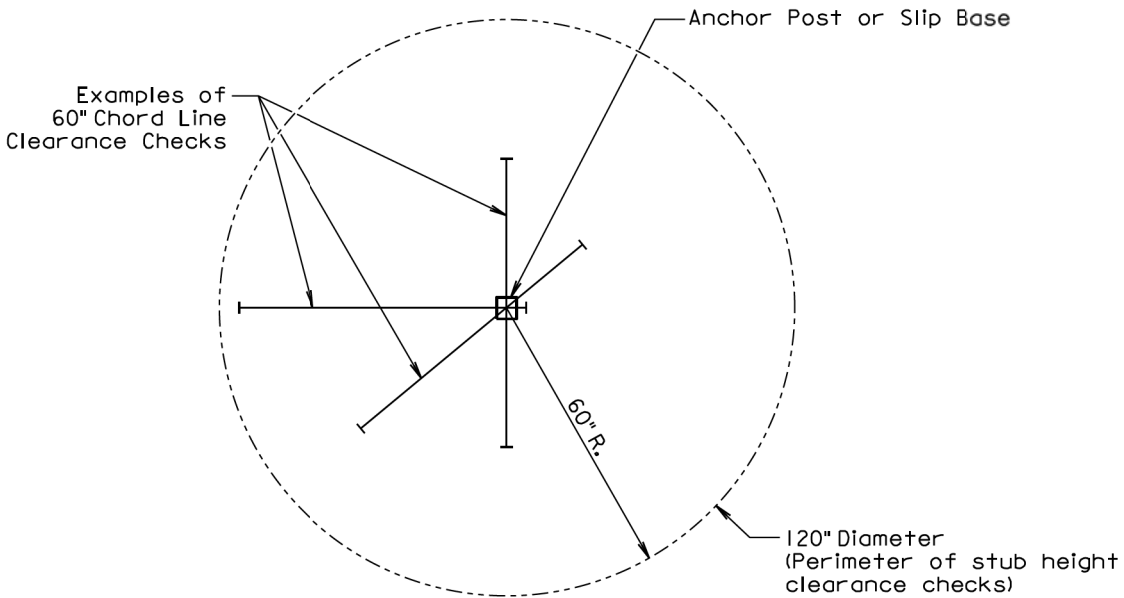
Sheet 1 of 1

1:200
Plot Scale -

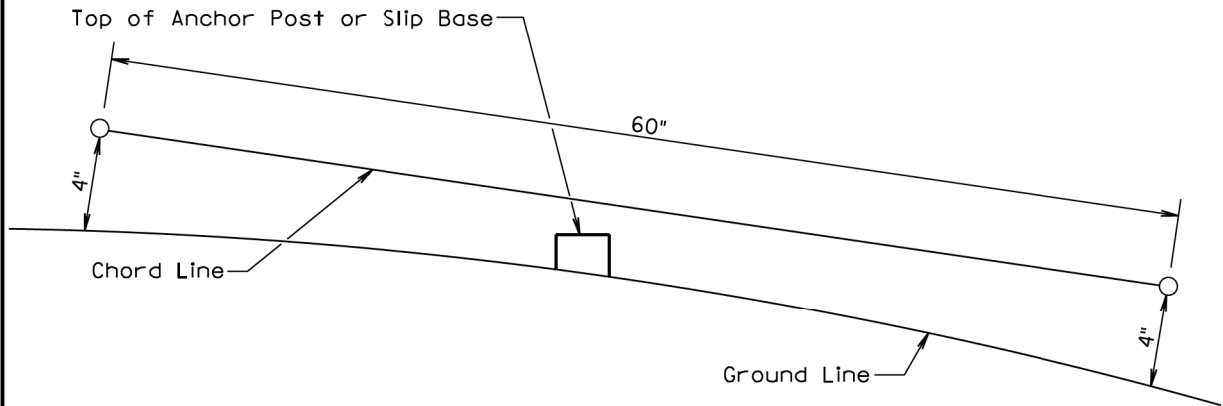
trc11610
- Plotted From -

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	385-451	12	25

Plotting Date: 09/03/2013



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

<i>Published Date: 3rd Qtr. 2013</i>	S D D O T	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
			Sheet 1 of 1

File - ...StdPlatePg2.dgn

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	385-451	13	25

Plotting Date: 09/03/2013

INDEX OF SHEETS -

Sheet No. 1 - Layout, Quantities and Details
 Sheet No. 2 - Subsurface Investigation
 Sheet No. 3 - Details of Standard Plate No. 680.03

- The Contractor shall consult with an approved MSE wall company and obtain design calculations and construction plans. Two copies of this data shall be forwarded to the Office of Bridge Design a minimum of 2 weeks in advance of construction for approval. Construction plans shall include plan view, elevation view (to include elevations), typical cross sections, foundation and drainage details, material and construction specifications, and a detailed listing of all quantities required for MSE wall construction including segmental blocks, excavation, soil reinforcement and granular backfill, excavation, soil reinforcement and granular backfill.
- Walls which use steel or polymeric soil reinforcement shall be constructed in accordance with the 1996 AASHTO Standard Specifications for Highway Bridges with 1997 and 1998 Interims, Division II, Section 7.6.4.
- A 2 ft. undercut of the foundation area is required. After the undercut has been removed, 6" of the undercut area shall be scarified, watered to optimum moisture and compacted to 95% of maximum dry density as determined by SD 104. This shall be done before the undercut backfill is placed. All costs in excavating, scarifying, watering, and recompacting shall be included in the contract unit price per cubic yard for Footing Undercut.
- Undercut backfill shall be brought up to grade with granular material conforming to the specifications for Aggregate Base Course. Undercut backfill shall be paid for at the contract unit price per ton for Base Course.
- The minimum embedment depth to the top of the leveling pad for mechanically stabilized earth wall shall be 2'-0". The steps shown are for bidding quantity purposes only. The wall designer shall determine the actual bottom of wall profile.
- Backfill for the MSE wall shall be granular material conforming to the following specifications:

Stone Size	Percent Passing
Inch	100
No. 4	20 - 100
No. 40	0 - 60
No. 200	0 - 15

Plasticity Index: Less than or equal to 6

The Contractor has the option of manufacturing this material from Rhyolite sources on the job or obtaining material from an independent source.

- Quantities listed are for bidding purposes only. Actual quantities for the above listed items must be determined from design calculations as incorporated in the shop drawings supplied by the wall designer and will be adjusted accordingly for pay purposes.
- All costs involved in furnishing & installing the Type B Drainage Fabric shall be incidental to the contract unit price per cubic yard for Granular Backfill for MSE Modular Wall.

GRANULAR BACKFILL COMPACTION

- Granular Backfill for MSE Modular Block Wall shall be compacted to a minimum of 95 percent of the maximum density as determined by SD 104. The compactive effort shall consist of at least 4 passes with a vibratory roller and/or vibratory plate compactor. If adequate compaction is not achieved using the selected equipment, the size of the vibratory roller and/or vibratory plate compactor shall be increased as directed by the Engineer.
- The moisture content of the backfill material prior to and during compaction shall be uniformly distributed throughout each layer. Water shall be applied at minimum rate of 0.15 gal/sq. ft. of surface area per lift.
- The maximum lift thickness prior to compaction shall not exceed 8 inches. The Contractor shall decrease this thickness, when ordered by the Engineer, to obtain the specified density. The lift thickness shall be dependent on the Contractor's compaction equipment and shall be adjusted as needed to obtain specified density.

ORIGINAL CONSTRUCTION PLANS

LAYOUT, QUANTITIES AND DETAILS
FOR

M. S. E. MODULAR RETAINING WALL

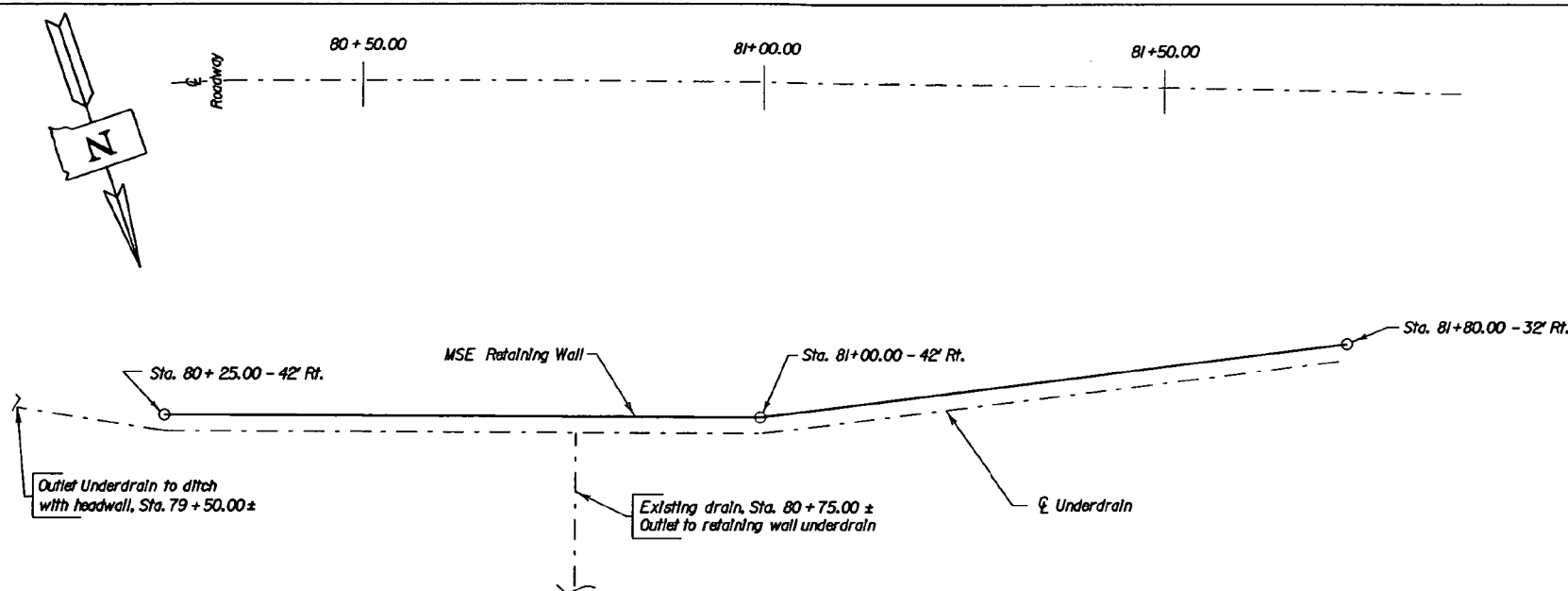
STA. 80+25.00 TO 81+71.00 Rt. SEC. 18-T4N-R4E
 PCMS NO. 0566 P-BRF 0385(14) 115

LAWRENCE COUNTY
 S. D. DEPT. OF TRANSPORTATION
 FEBRUARY 2002

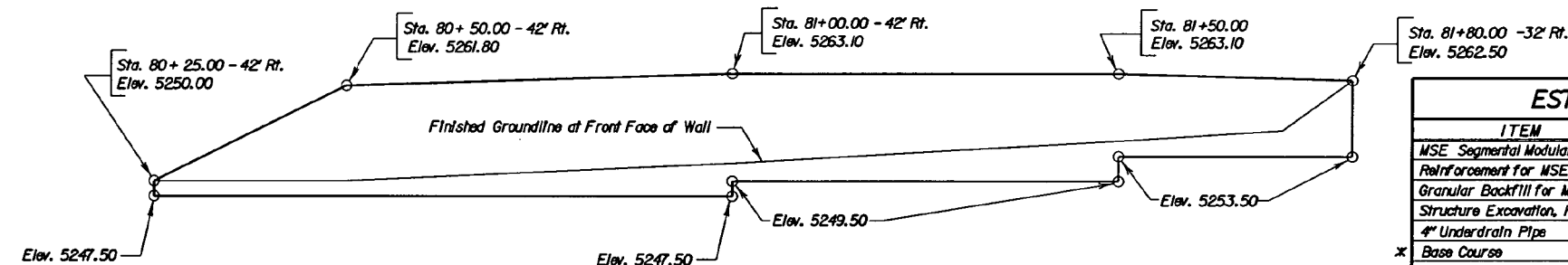
① OF ③

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
SJ/HE	REM	SJ/HE	John C. Cole
LAWR0566	0566JH01		BRIDGE ENGINEER

PLANS BY :
 OFFICE OF BRIDGE DESIGN, SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION



PLAN



ELEVATION

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY
MSE Segmental Modular Wall	Sq.Ft.	1925
Reinforcement for MSE Modular Wall	Sq.Yd.	906
Granular Backfill for MSE Modular Wall	Cu.Yd.	764
Structure Excavation, Retaining Wall	Cu.Yd.	908
4" Underdrain Pipe	Ft.	231
* Base Course	Ton	270
Footing Undercut	Cu.Yd.	143
Precast Concrete Headwall for Drain	Each	1

* A factor of 1.89 tons/cu.yd. was used to convert cu. yds. to tons.

SPECIFICATIONS

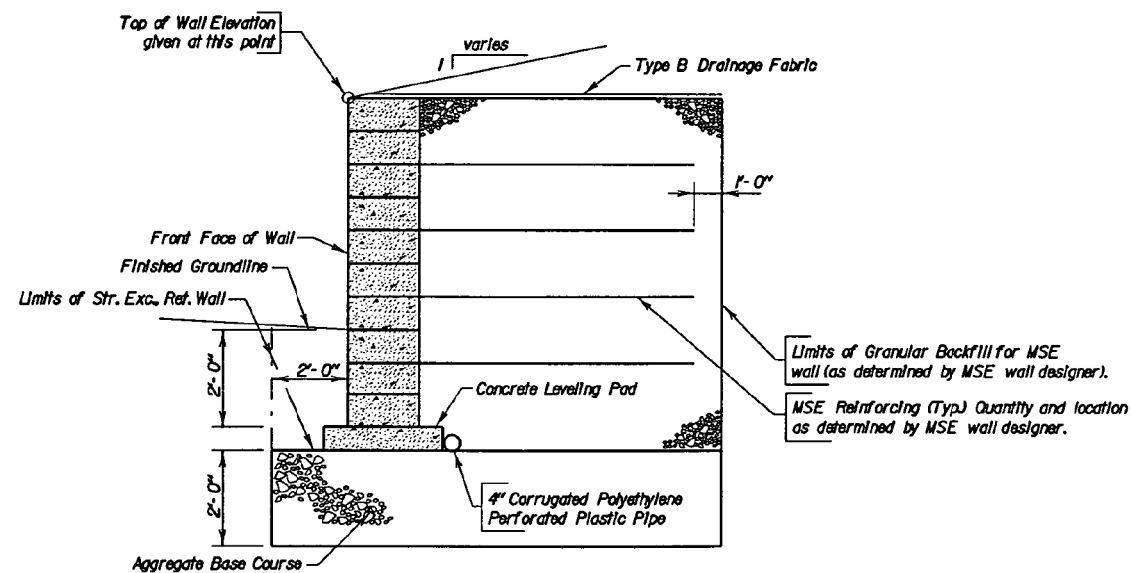
- Design Specifications: AASHTO Specifications for Highway Bridges, 1996 Edition with 1997 thru 2000 Interims.
- Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, 1998 Edition and Required Provisions, Supplemental Specifications and/or Special Provisions as Included in the Proposal.

UNDERDRAIN

- An underdrain system shall be installed behind the wall as shown and detailed on this sheet. The underdrain system shall consist of 4 inch diameter perforated corrugated polyethylene tubing installed below the wall and 4 inch diameter non-perforated corrugated polyethylene tubing from the end of the wall to the headwall as shown. In addition, an existing homeowner drain shall be tied into the subdrain with 4 inch diameter non-perforated pipe as shown.
- The polyethylene drainage tubing shall conform to Section 990 of the South Dakota Standard Specifications.
- All costs involved in furnishing and installing the 4 inch diameter perforated corrugated polyethylene tubing and 4 inch diameter non-perforated corrugated polyethylene tubing shall be included in the contract unit price per linear foot for 4 inch Underdrain Pipe. All costs involved in tying the existing homeowner drain to the subdrain shall be incidental to the various contract items.

RETAINING WALL

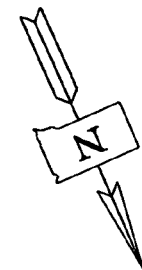
- The Mechanically Stabilized Earth (MSE) Segmental (Modular) Retaining Wall (hereafter referred to as MSE wall) shall be on the current approved list located at the following Internet Address: <http://www.state.sd.us/dot/pe/materials/approduct.htm>



TYPICAL SECTION

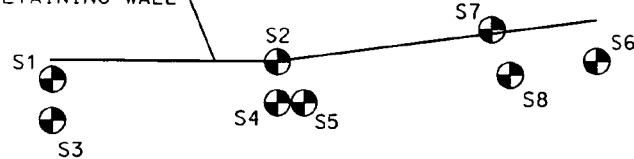
STATE OF SOUTH DAKOTA	PROJECT 385-451	SHEET 14	TOTAL SHEETS 25
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Plotting Date: 09/03/2013



80+00 81+00 82+00 CL ROADWAY

MODULAR BLOCK RETAINING WALL



SCHIST IS DEFINED AS A FINE GRAINED CRYSTALLINE ROCK THAT CAN BE READILY PARTED OR SPLIT BECAUSE IT HAS A FOLIATED OR PARALLEL STRUCTURE. IT IS ANTICIPATED THAT THE SCHIST IS JOINTED AND FRACTURED BUT PIECES AND BLOCKS WILL BE TIGHTLY INTERLOCKED. FIELD HARDNESS IS CLASSIFIED AS MEDIUM TO SOFT ROCK. WEATHERING IS CLASSIFIED AS MODERATE TO SEVERE. THE SCHIST MAY ALSO CONTAIN MINOR DIKES OF QUARTZ.

THE GEOTECHNICAL ENGINEERING ACTIVITY HAS ON FILE ALL OF THE BORING LOGS FOR THIS PROJECT. THESE LOGS AND ADDITIONAL RESULTS OF LABORATORY TESTS, IF ANY, ARE AVAILABLE FOR REVIEW AT THE CENTRAL OFFICE IN PIERRE.

LEGEND

● AUGER TEST

□ SAMPLE ZONE

GRANULAR BASE PARAMETERS:

ALLOWABLE LOADING PRESSURE $q_a = 3,000$ psf
FRICTION ANGLE $\phi = 32$ degrees
COHESION $c = 0$ psf
WET UNIT WEIGHT $\gamma_w = 130$ pcf
DRY UNIT WEIGHT $\gamma_d = 120$ pcf

CLAY-SILT SOIL PARAMETERS:

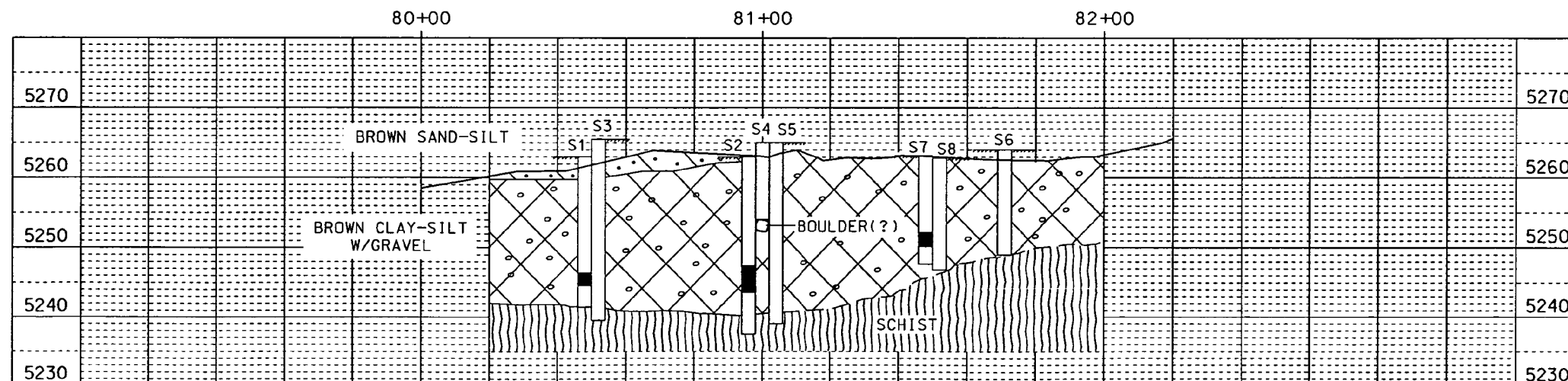
FRICTION ANGLE $\phi = 28$ degrees
COHESION $c = 100$ psf
WET UNIT WEIGHT $\gamma_w = 127$ pcf
DRY UNIT WEIGHT $\gamma_d = 108$ pcf

Values for the friction angle and cohesion are average values derived from direct shear tests. The friction angle ranged from 23 - 47 degrees. The cohesion ranged from 0 - 267 psf. No reductions or safety factors have been applied to these parameters.

GROUND WATER ELEVATIONS AS
OF AUGUST 2001

S1	Dry
S2	Dry
S3	Dry
S4	Dry
S5	Dry
S6	Dry
S7	Dry
S8	Dry

HOLE NUMBER	S1	HOLE NUMBER	S2	HOLE NUMBER	S7
STATION	80+50	STATION	81+00	STATION	81+50
DEPTH	18.5 ft	DEPTH	19.5 ft	DEPTH	13.0 ft
SOIL COLOR	BROWN	SOIL COLOR	BROWN	SOIL COLOR	BROWN
CLASSIFICATION	SILT	CLASSIFICATION	CLAY-SILT	CLASSIFICATION	CLAY-SILT
STRENGTH (q_u)	1113 psf	STRENGTH (q_u)	787 psf	STRENGTH (q_u)	716 psf
DRY DENSITY	116.1 pcf	DRY DENSITY	106.9 pcf	DRY DENSITY	95.4 pcf
WET DENSITY	135.9 pcf	WET DENSITY	128.8 pcf	WET DENSITY	116.2 pcf
MOISTURE	17.1 %	MOISTURE	20.4 %	MOISTURE	21.8 %
PASS NO. 10	95.0 %	PASS NO. 10	98.6 %	PASS NO. 10	99.8 %
PASS NO. 40	78.2 %	PASS NO. 40	91.2 %	PASS NO. 40	99.0 %
PASS NO. 200	61.3 %	PASS NO. 200	62.8 %	PASS NO. 200	76.4 %
SAND CONTENT	33.8 %	SAND CONTENT	35.8 %	SAND CONTENT	23.4 %
SILT CONTENT	42.4 %	SILT CONTENT	41.3 %	SILT CONTENT	50.7 %
CLAY CONTENT	18.8 %	CLAY CONTENT	21.5 %	CLAY CONTENT	25.8 %



ORIGINAL CONSTRUCTION PLANS

SUBSURFACE INVESTIGATION
FOR

M. S. E. MODULAR RETAINING WALL

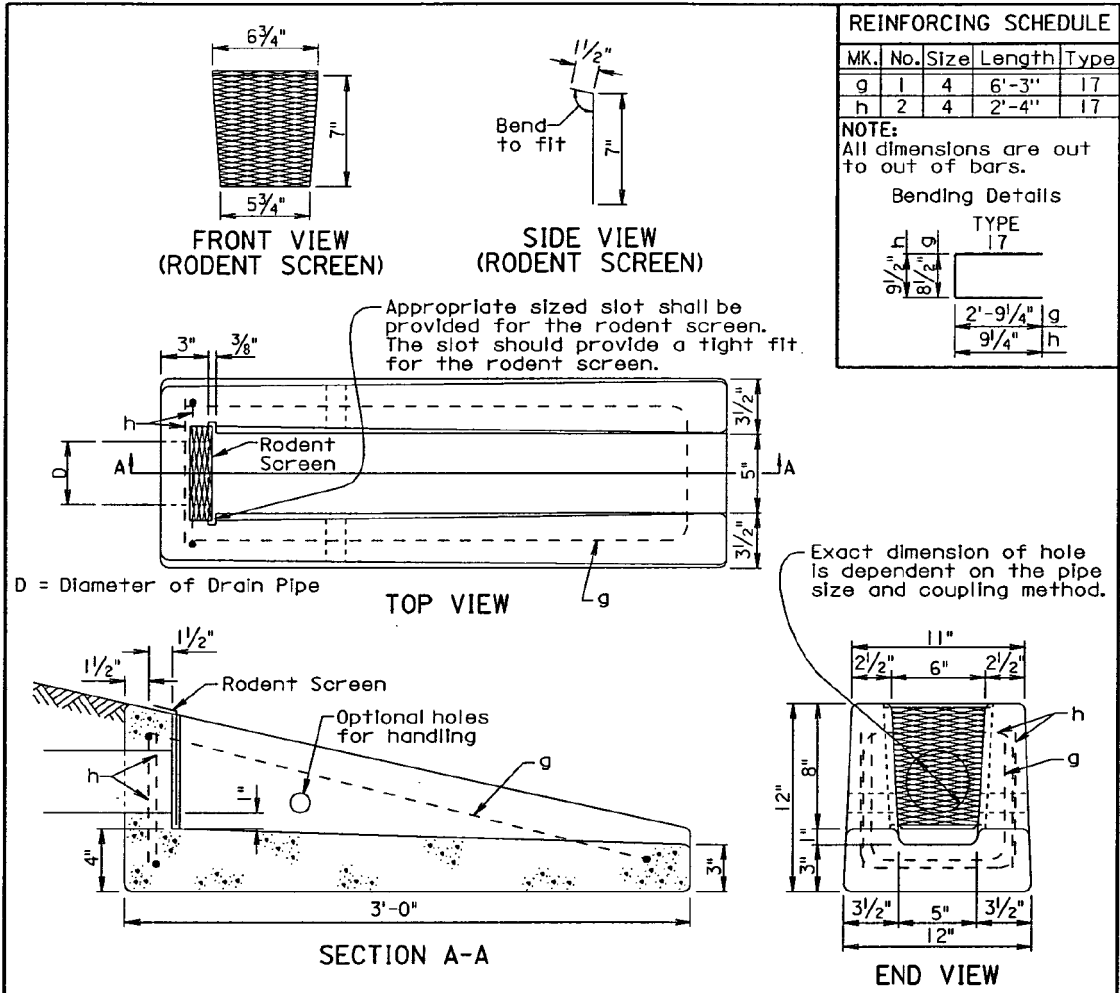
STA. 80+25.00 TO 81+71.00 Rt. SEC. 18-T4N-R4E
P-BRF 0385(14)115LAWRENCE COUNTY
S. D. DEPT. OF TRANSPORTATION
FEBRUARY 2002

2 OF 3

DESIGNED BY SJ	DRAWN BY REM	CHECKED BY SJ	APPROVED John C. Cole BRIDGE ENGINEER
LAWR0566	0566JH02		

STATE OF SOUTH DAKOTA	PROJECT 385-451	SHEET	TOTAL SHEETS
		15	25

Plotting Date: 09/03/2013



GENERAL NOTES:		
The concrete shall be Class M6. The concrete shall conform to the requirements of section 462 of the Standard Specifications. It is estimated that each unit weighs approximately 210 pounds.		
All reinforcing steel shall conform to ASTM A615 Grade 60 and shall be epoxy coated. The reinforcing steel shall be securely retained to prevent displacement during placement of concrete. It is estimated that 7.3 pounds of reinforcing steel is required for each unit.		
The pipe shall be placed in the concrete headwall with the pipe end flush with the concrete surface adjacent to the rodent screen.		
The rodent screen shall be galvanized 13 Ga. steel with a diamond shaped flattened mesh pattern. The size shall be 1/2". The size refers to the measurement across the smallest diamond shaped opening measured from the centers of the wires.		
The drawing indicates using 1/2" fillets; however, 3/4" chamfers may be substituted for the 1/2" fillets.		
All costs for furnishing and installing the concrete headwall including equipment, labor, and materials including concrete, reinforcing steel, and rodent screen shall be incidental to the contract unit price per each for "Precast Concrete Headwall for Drain".		
March 28, 2001		
S D D O T	PRECAST CONCRETE HEADWALL FOR DRAIN	PLATE NUMBER 680.03
		Sheet 1 of 1

ORIGINAL CONSTRUCTION PLANS

M. S. E. MODULAR RETAINING WALL
STA. 80+25.00 TO 81+71.00 R+.
FEBRUARY 2002

3 OF 3

SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION
MODULAR UNIT RETAINING WALL SUBMITTALS
ADJACENT TO US HWY 385
P-BRF 0385(14)115, PCEMS 0566
LAWRENCE COUNTY, SOUTH DAKOTA

JUNE 2002

STATE OF SOUTH DAKOTA	PROJECT 385-451	SHEET 16	TOTAL SHEETS 25
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Plotting Date: 09/03/2013

CONSTRUCTION NOTES FOR SEGMENTAL RETAINING WALLS
MATERIALS

GRANULAR BACKFILL FOR MSE (MODULAR) WALL

1. GRANULAR BACKFILL FOR MSE (MODULAR) WALL SHALL CONSIST OF FREE-DRAINING, SOUND, DURABLE PARTICLES OF WELL GRADED GRAVELS OR CRUSHED STONE CONFORMING TO THE GRADATION AS FOLLOWS:

SIEVE SIZE	PERCENT PASSING
1"	100
NO. 4	20-100
NO. 40	0-60
NO. 200	0-15

PLASTICITY INDEX: LESS THAN OR EQUAL TO 6

GEOGRIDS

1. GEOGRIDS SHALL CONFORM TO THE TYPE, SIZE, AND LENGTH AS SHOWN ON THE PLANS.

UNDERDRAINS

1. UNDERDRAIN PIPE AND FITTINGS SHALL CONFORM TO SDDOT STANDARD SPECIFICATION 990.
2. USE 4" DIAM. PERFORATED CORRUGATED POLYETHYLENE PIPE TO COLLECT WATER AND 4" DIAM. NON PERFORATED CORRUGATED POLYETHYLENE PIPE FOR OUTFALL LINE.

EXECUTION

GENERAL

1. FOLLOW ALL APPLICABLE PROVISIONS OF THE MANUFACTURERS INSTALLATION INSTRUCTIONS AND WRITTEN SPECIFICATIONS.
2. COMPACTION TESTS SHALL BE TAKEN AS THE WALL IS INSTALLED. THE MINIMUM NUMBER OF TESTS SHALL BE 2 TESTS EVERY OTHER LIFT.
3. MINIMUM EMBEDMENT OF WALL BELOW FINISH GRADE SHALL BE 2 FEET UNLESS SHOWN DIFFERENTLY ON THE PLANS.

LAYOUT

1. WALL ALIGNMENT SHALL BE LOCATED IN THE FIELD BY THE CONTRACTOR. IF WALL CONFIGURATION DIFFERS FROM THE WALL REPRESENTED IN THE CONTRACT DRAWINGS OR SPECIFICATIONS, THE CONTRACTOR MUST CONTACT THE PROJECT ENGINEER TO VERIFY CHANGED CONDITIONS AND THE WALL DESIGN PRIOR TO START OF CONSTRUCTION.

EXCAVATION

1. STRIP ALL VEGETATION AND ORGANIC SOIL FROM UNDER WALL AND RETAINED SOIL AREA
2. EXCAVATE TO THE LINES AND GRADES AS SHOWN. CARE SHALL BE TAKEN TO NOT DISTURB THE AREA BEYOND THE LINES SHOWN. EMBANKMENT EXCAVATION SHALL BE BENCH CUT.

FOUNDATION SOIL PREPARATION

1. FOUNDATION SOIL SHALL BE EXCAVATED AS REQUIRED FOR FOOTING DIMENSIONS SHOWN ON THE CONSTRUCTION DRAWINGS OR AS DIRECTED BY THE PROJECT ENGINEER.
2. FOUNDATION SOIL SHALL BE EXAMINED BY THE PROJECT ENGINEER TO INSURE THAT THE ACTUAL FOUNDATION SOIL STRENGTH MEETS OR EXCEEDS THE ASSUMED DESIGN STRENGTH. SOIL NOT MEETING THE REQUIRED STRENGTH SHALL BE REMOVED AND REPLACED WITH ACCEPTABLE MATERIAL.
3. OVER-EXCAVATED AREAS SHALL BE FILLED WITH COMPACTED AGGREGATE BASE COURSE.

LEVELING PAD

1. LEVELING PAD SHALL CONSIST OF UNREINFORCED CONCRETE CONSTRUCTED IN ACCORDANCE WITH THESE SHOP DRAWING SUBMITTALS.

UNIT INSTALLATION

1. THE FIRST COURSE OF WALL UNITS SHALL BE PLACED ON THE PREPARED LEVELING PAD. THE UNITS SHALL BE CHECKED FOR LEVEL AND ALIGNMENT. THE FIRST COURSE IS THE MOST IMPORTANT TO INSURE ACCURATE AND ACCEPTABLE RESULTS.
2. INSURE THAT UNIT IS IN FULL CONTACT WITH LEVELING PAD.
3. PLACE UNITS SIDE BY SIDE FOR FULL LENGTH OF WALL ALIGNMENT. ALIGNMENT SHALL BE DONE BY USING A STRING LINE OR OFFSET FROM A BASELINE. THE CONTRACTOR SHALL FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS WHEN MAKING CORNERS AND TIGHT RADIUS CURVES.
4. PLACE AND COMPACT FILL TO TOP OF UNIT COURSE.
5. SWEEP ALL EXCESS MATERIAL FROM THE TOP OF UNITS AND INSTALL NEXT COURSE. INSURE THAT ALL VOIDS ARE FILLED.
6. LAY UP EACH COURSE INSURING A POSITIVE CONNECTION BETWEEN ADJACENT COURSES FOLLOWING THE MANUFACTURER'S INSTRUCTIONS. THE UNITS SHALL BE PULLED FORWARD TO REMOVE ANY SLACK IN THE CONNECTION. REPEAT PROCEDURE TO THE EXTENT OF THE WALL HEIGHT.

GEOGRID INSTALLATION

1. THE GEOGRID REINFORCEMENT SHALL BE LAID HORIZONTALLY WITH ITS STRONG AXIS PERPENDICULAR TO THE WALL ON THE COMPACTED BACKFILL. PLACE GRID ON MASONRY UNIT, LAY SUCCEEDING COURSE OF UNITS, INSTALL PINS, PULL GRID TAUT, AND ANCHOR GEOGRID PRIOR TO PLACING BACKFILL.
2. SLACK IN THE GEOGRID AT THE WALL UNITS SHALL BE REMOVED IN A MANNER, AND TO SUCH AS DEGREE, AS APPROVED BY THE PROJECT ENGINEER.
3. LOCATION AND PLACEMENT OF THE GEOGRID IS AS SHOWN ON THE DRAWINGS.

STAIR INSTALLATION

1. STAIRS SHALL BE CONSTRUCTED USING THE 'BASE PEDESTAL METHOD' AS SHOWN IN THE CONSTRUCTION DETAILS INCLUDED.

GRANULAR BACKFILL FOR MSE (MODULAR) WALL

1. GRANULAR BACKFILL FOR MSE (MODULAR) WALL SHALL BE PLACED IN CONFORMANCE WITH DESIGN PLAN NOTES.
2. BACKFILL AND COMPACT IN FRONT OF THE WALL PRIOR TO WALL HEIGHT EXCEEDING FINISHED GRADES IN FRONT OF THE WALL.
3. BACKFILL SHALL BE PLACED FROM THE WALL OUTWARD TO INSURE THAT THE GEOGRID REMAINS TAUT. BACKFILL SHALL BE PLACED, SPREAD, AND COMPACTED IN SUCH A MANNER THAT MINIMIZES THE DEVELOPMENT OF WRINKLES OR MOVEMENT OF THE GEOGRID.
4. ONLY HAND OPERATED COMPACTION EQUIPMENT SHALL BE ALLOWED WITHIN 3 FEET OF THE WALL FACE.
5. TRACKED CONSTRUCTION EQUIPMENT SHALL NOT BE OPERATED DIRECTLY ON THE GEOGRID. A MINIMUM BACKFILL THICKNESS OF 6 INCHES IS REQUIRED PRIOR TO OPERATION OF TRACKED VEHICLES OVER THE GEOGRID. TURNING OF THE TRACKED VEHICLES SHOULD BE KEPT TO A MINIMUM TO PREVENT DISPLACING THE FILL AND DAMAGING THE GEOGRID.
6. RUBBER Tired EQUIPMENT MAY PASS OVER THE GEOGRID REINFORCEMENT AT SPEEDS LESS THAN 5 MPH. SUDDEN BRAKING AND SHARP TURNING SHALL BE AVOIDED.

UNDERDRAINS

1. UNDERDRAIN SHALL BE INSTALLED AS SHOWN ON THE PLANS.

FINAL APPEARANCE

1. PROVIDE LATERAL DRAINAGE SWALES TO DIRECT FLOW AROUND THE ENDS OF THE WALL.
2. ESTABLISH TURF AS SOON AS THE WALL IS COMPLETED.

DESIGN NOTES FOR SEGMENTAL RETAINING WALLS

DESIGN ASSUMPTIONS:

1. ALLOWABLE BEARING PRESSURE: WALL 1 - 3000 PSF, WALLS A,B,C - 2000 PSF.
2. BACKFILL IS WELL DRAINED.
3. REINFORCED FILL CONSISTS OF GRANULAR MATERIAL.
4. GRID QUANTITIES AND LENGTHS BASED UPON ASSUMED SOIL CONDITIONS AND DO NOT REFLECT ANY INCREASE NEEDED TO MEET GLOBAL STABILITY REQUIREMENTS DUE TO POOR FOUNDATIONS.

SOILS PARAMETERS	PHI	C	GAMMA
REINFORCED FILL	32	0	130
RETAINED SOIL	28	100	128
FOUNDATION SOIL	32	0	130

LEVELING PAD:	NON REINFORCED CONCRETE
SURCHARGE:	250 PSF - WALL 1 AND WALL C
SURCHARGE:	NONE - WALL A AND WALL B
ANGLE OF FACE:	1 1/2° + 12° (7.125°)

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF SOUTH DAKOTA.

NAME: ALLAN SCHREIER
DATE: 6/2002 REG. NO. 5103
SIGNED: ALL - Schreier

ORIGINAL CONSTRUCTION PLANS



ALLAN SCHREIER, PE
RR2, BOX 144W
BELLE FOURCHE, SD 57717
605-892-2342

REVISED: 6/14/02

APPROVED:

BY:	INITIAL:	DATE:
DESIGNER:		
SUPPLIER:		
CONTRACTOR:		
OWNER/PROJECT ENG.:		

PROJECT:
SDDOT, LAWRENCE COUNTY
ADJ. TO US HWY 385
P-BRF 0385(14)115, PCEMS 0566

DRAWING DESCRIPTION:
TITLE SHEET-GENERAL NOTES

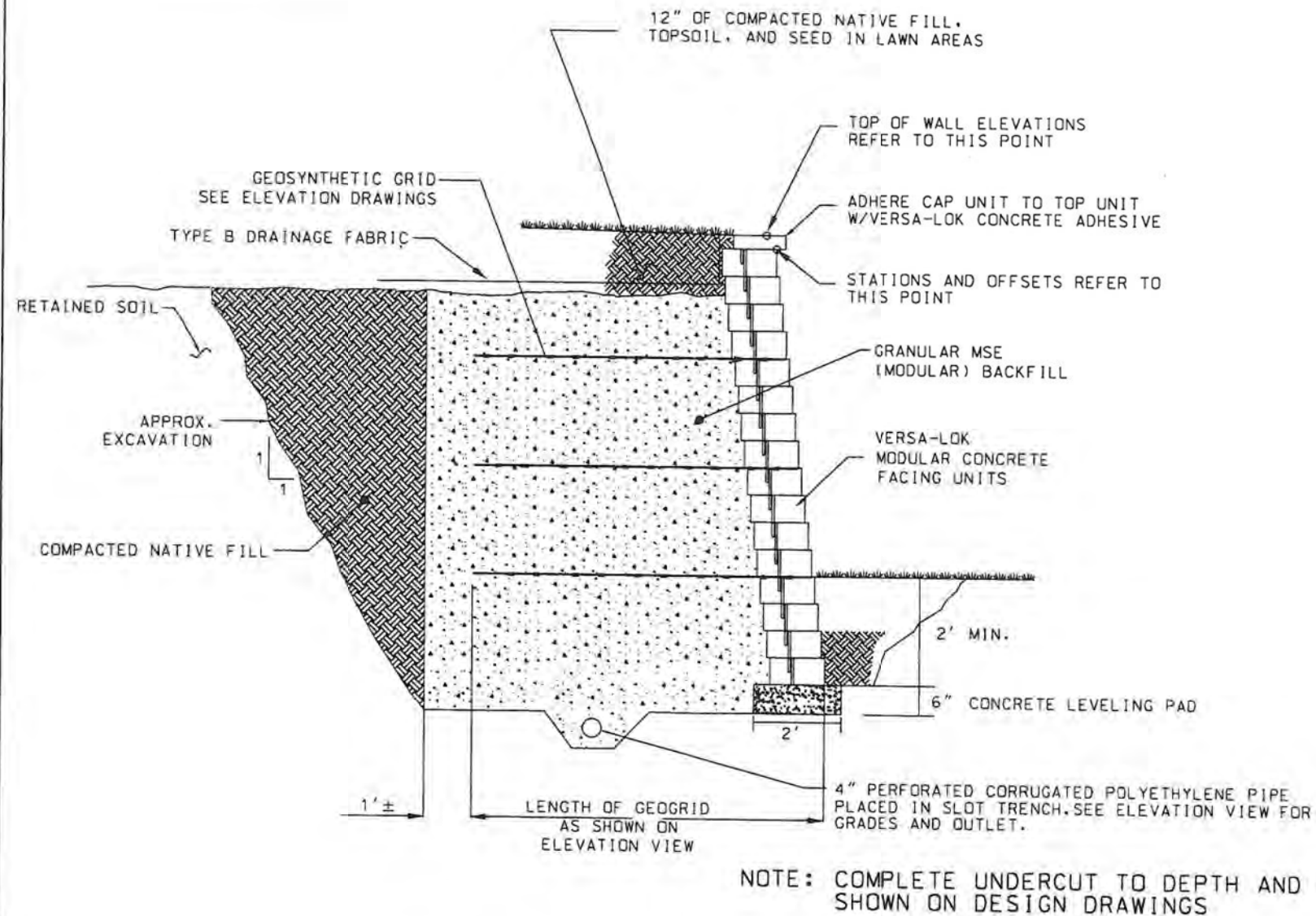
PREPARED FOR: DAKOTA BLOCK	TSHT.DGN
DRAWN BY: AMS	CHECKED BY: AMS
SHEET NO.: 1 of 10	DATE: 6/2002
JOB NO.: 1	

Plot Scale - 1:200

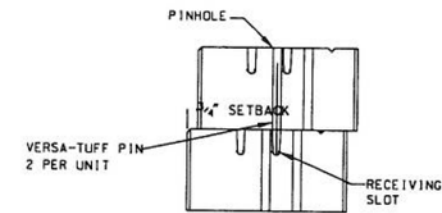
Plotted From - trc11610

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	385-451	17	25

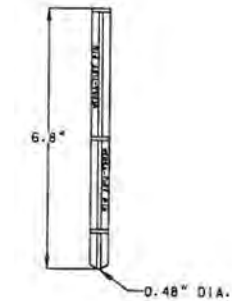
Plotting Date: 09/03/2013



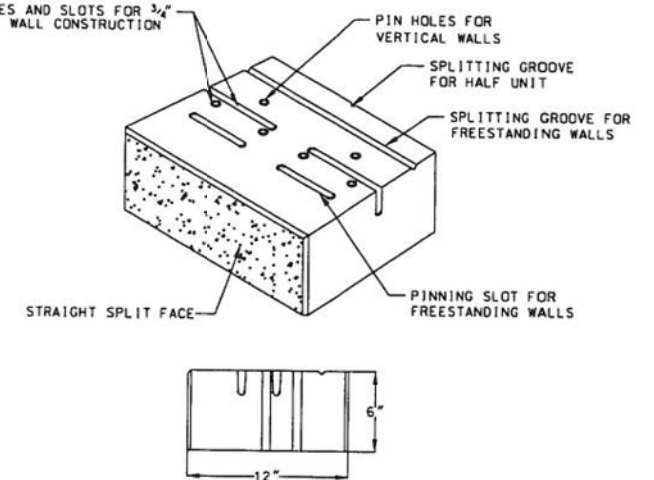
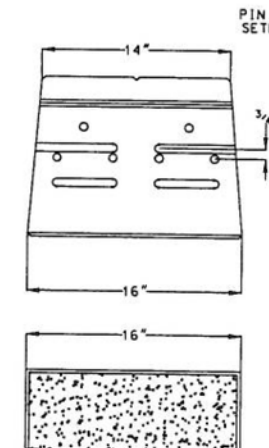
TYPICAL SECTION
MODULAR CONCRETE UNIT
RETAINING WALL
SCALE: NONE



PINNING DETAIL
CROSS SECTION
SCALE: NONE



VERSA-TUFF PIN
PIN DIMENSIONS
SCALE: NONE



VERSA-LOK UNIT
UNIT DIMENSIONS
SCALE: NONE

ORIGINAL CONSTRUCTION PLANS



VERSA-LOK®
Retaining Wall Systems
6348 Hwy. 36 Suite 1, Oakdale, MN 55128
(612) 770-3166 (800) 770-4525 fax (612) 770-4089

REVISED : 6/14/02

LEGEND

DRAINAGE FILL	CONCRETE
COMPACTED NATIVE SOIL	ANCHOR (GRID)
NATIVE SOIL	4" PERFORATED DRAIN TILE

PROJECT:
SDDOT, LAWRENCE COUNTY
ADJ. TO US HWY 385
P-BRF 0385(14)115, PCMS 0566

DRAWING DESCRIPTION:

RETAINING WALL DETAILS

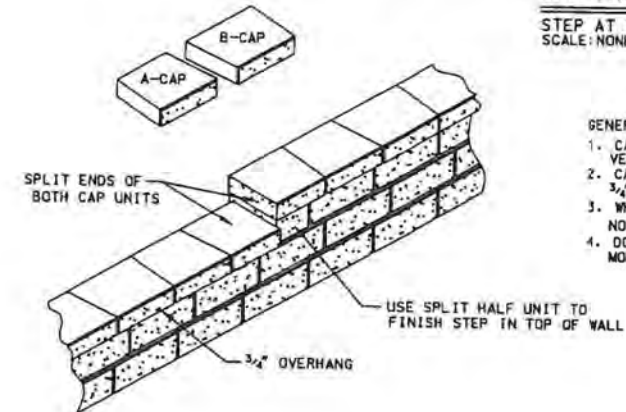
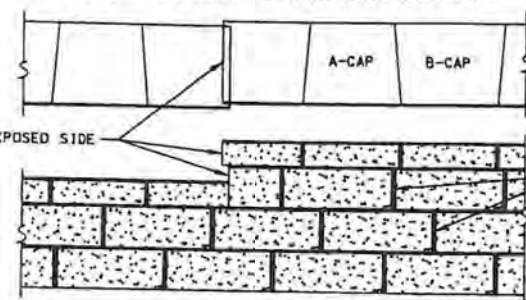
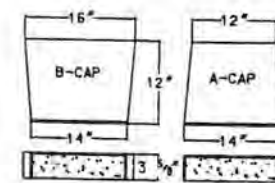
PREPARED FOR:	DET1.DGN
DAKOTA BLOCK	
DRAWN BY: AMS	CHECKED BY: AMS
SHEET NO. 1	2 OF 10
DATE:	6/2002
JOB NO. 1	1

...\\walls\\SE1\\FINALS\\AS1DET1.dgn 06/13/2002 10:09:05 PM

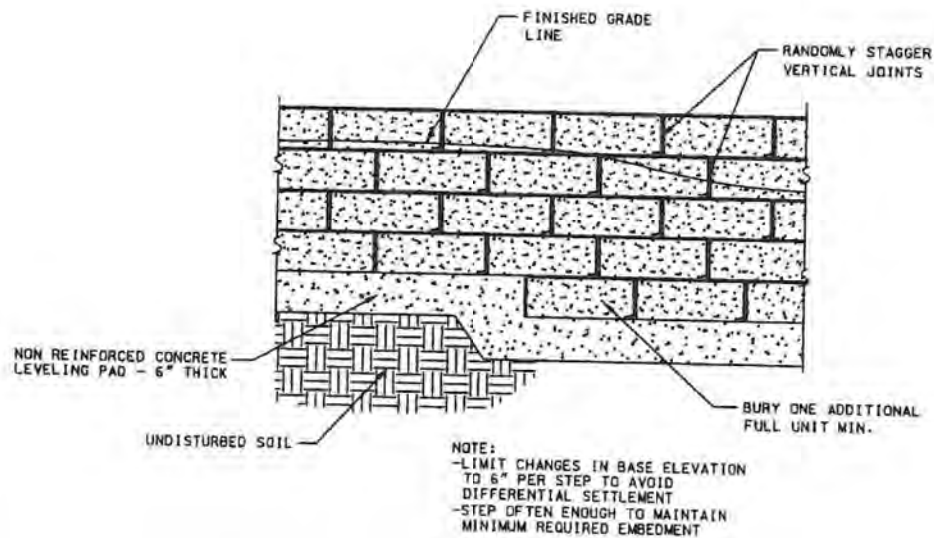
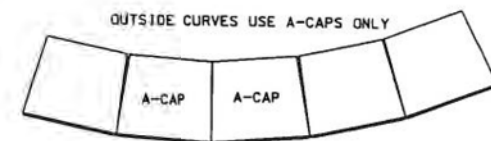
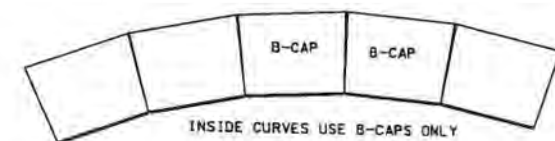
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STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	385-451	18	25

Plotting Date: 09/03/2013
FOR STRAIGHT WALLS, ALTERNATE A-CAP AND B-CAP









- GENERAL NOTES FOR CAPPING:
1. CAPS SHALL BE ADHERED TO WALL USING VERSA-LOK CONCRETE ADHESIVE
 2. CAPS MAY BE PLACED WITH A 1/2" TO 3/4" OVERHANG OF TOP COURSE
 3. WHEN SPLITTING CAP UNIT FOR WALL END DO NOT USE A CAP SECTION LESS THAN 6" WIDE
 4. DO NOT OVERHANG CAP AT END OF COURSE MORE THAN 1"



STEPPING BASE DETAIL
SCALE: NONE



VERSA-LOK®
Retaining Wall Systems
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(612) 770-3166 (800) 770-4525 fax (612) 770-4089

REVISD : LEGEND	
	DRAINAGE FILL
	COMPACTED NATIVE SOIL
	NATIVE SOIL
	CONCRETE
	ANCHOR (GRID)
	4" PERFORATED DRAIN TILE

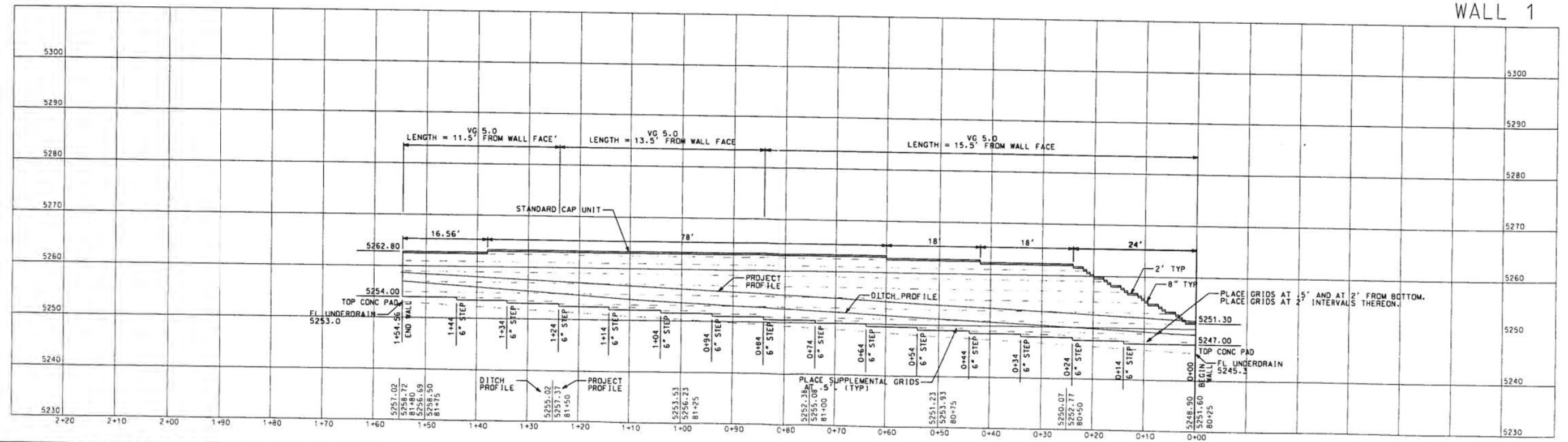
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PROJECT: SDDOT, LAWRENCE COUNTY ADJ. TO US HWY 385 P-BRF(14)115, PCMS 0566	PREPARED FOR: DAKOTA BLOCK
DRAWING DESCRIPTION: RETAINING WALL DETAILS	DRAWN BY: AMS CHECKED BY: AMS
	SHEET NO.: 4 OF 10
	DATE: 6/2002
	FOR NO. 1

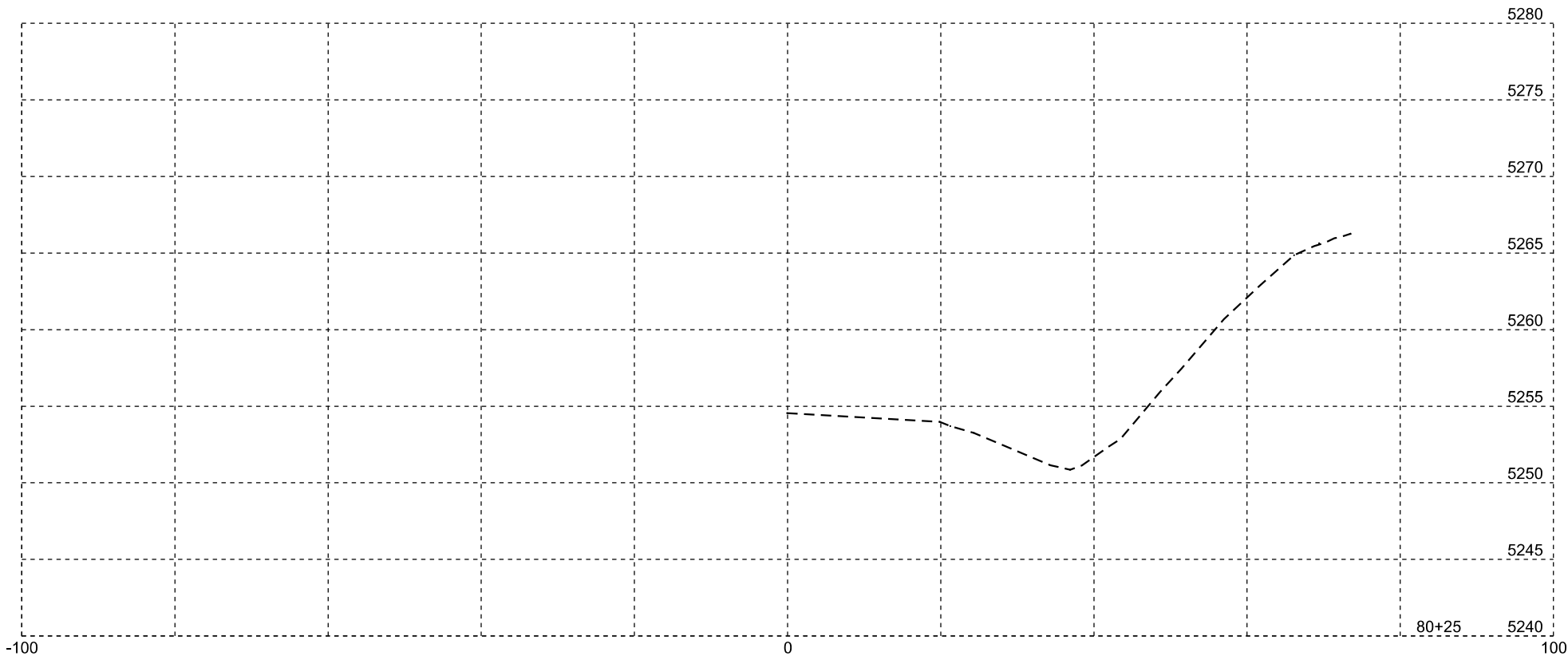
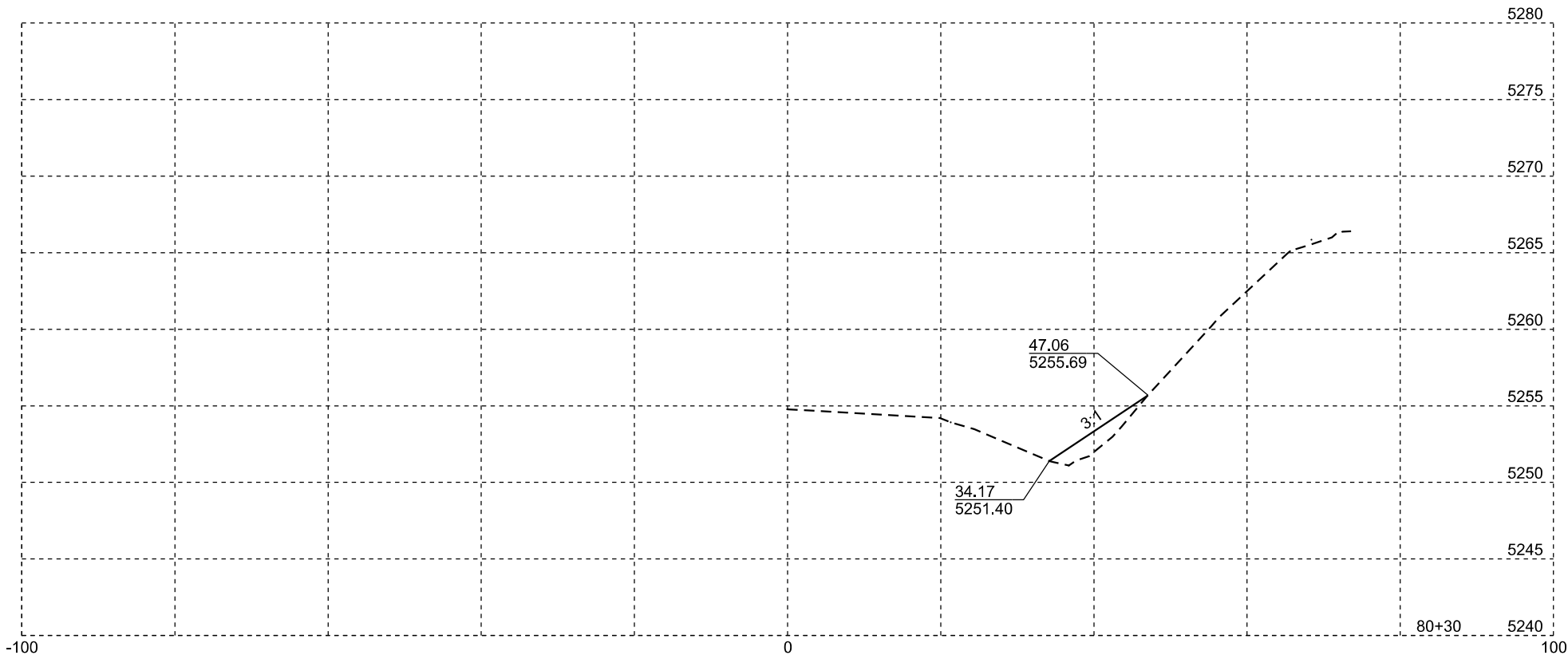
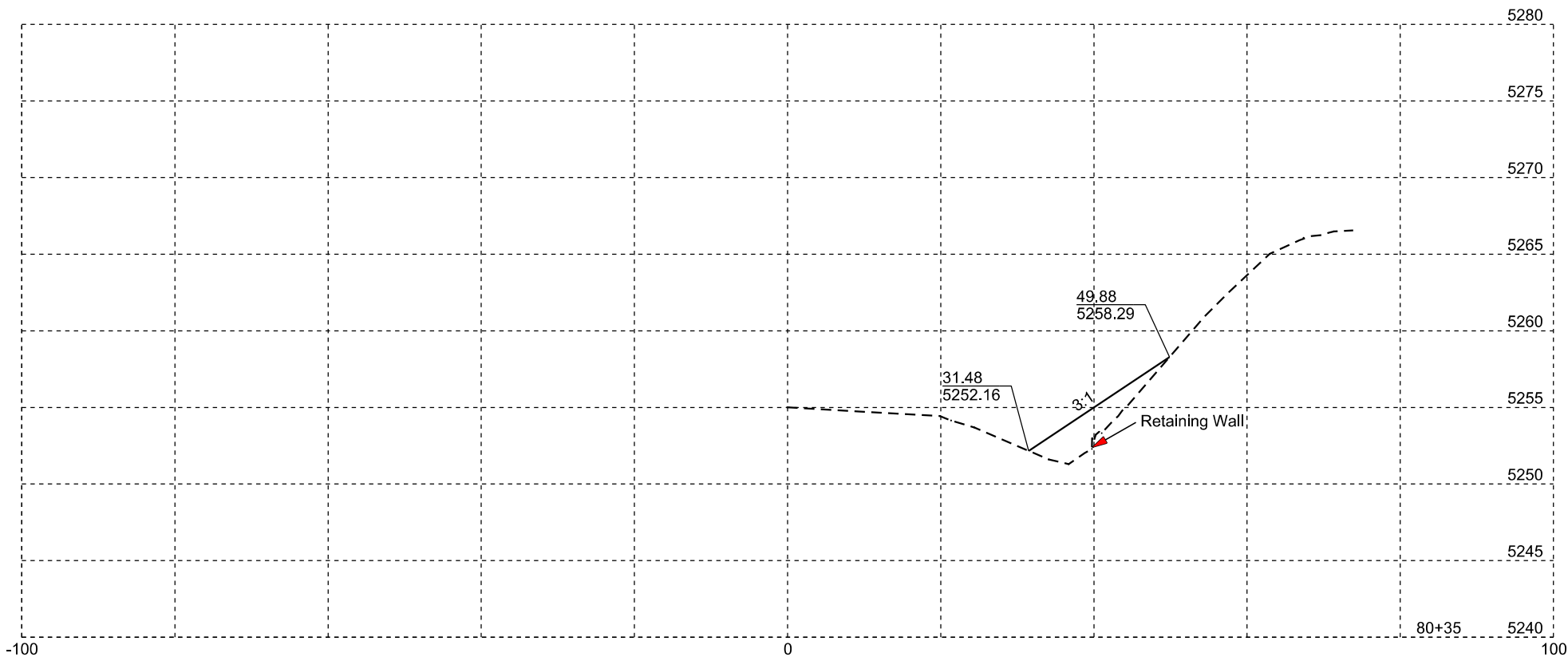
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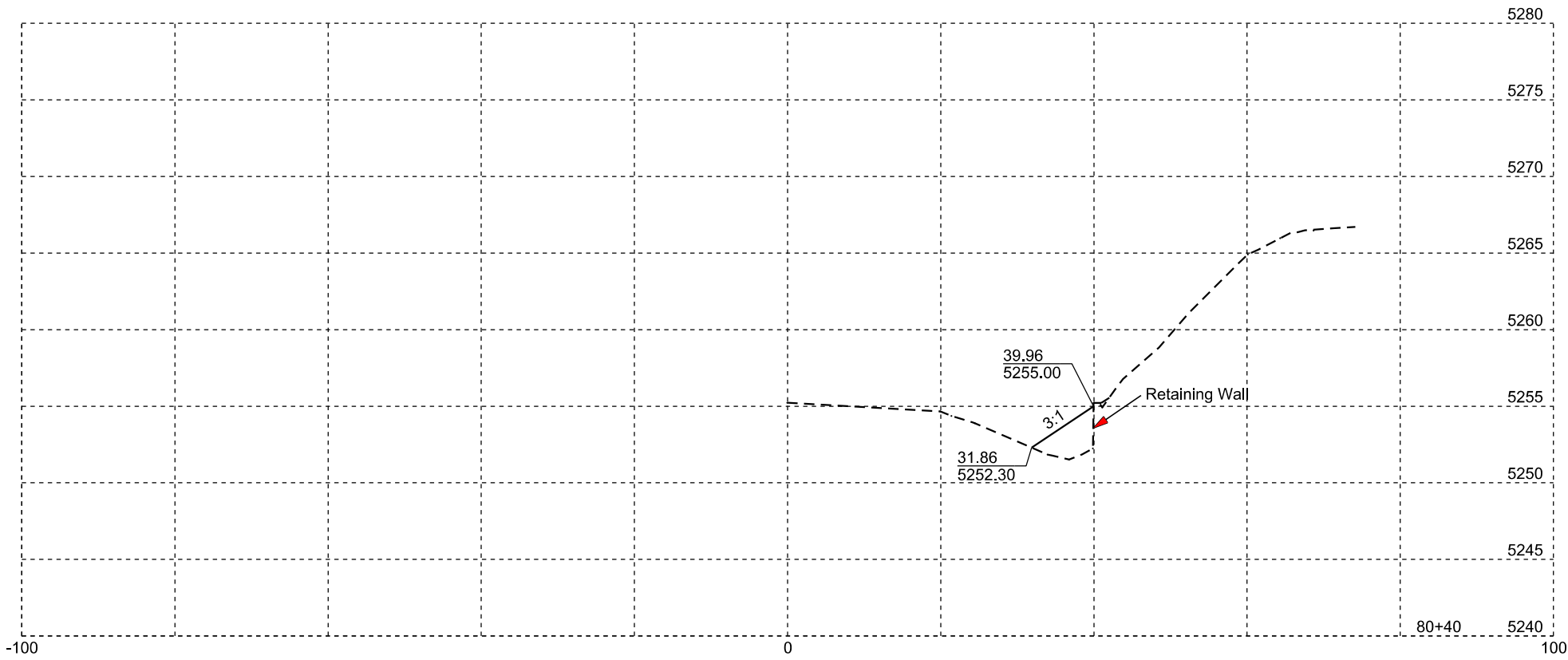
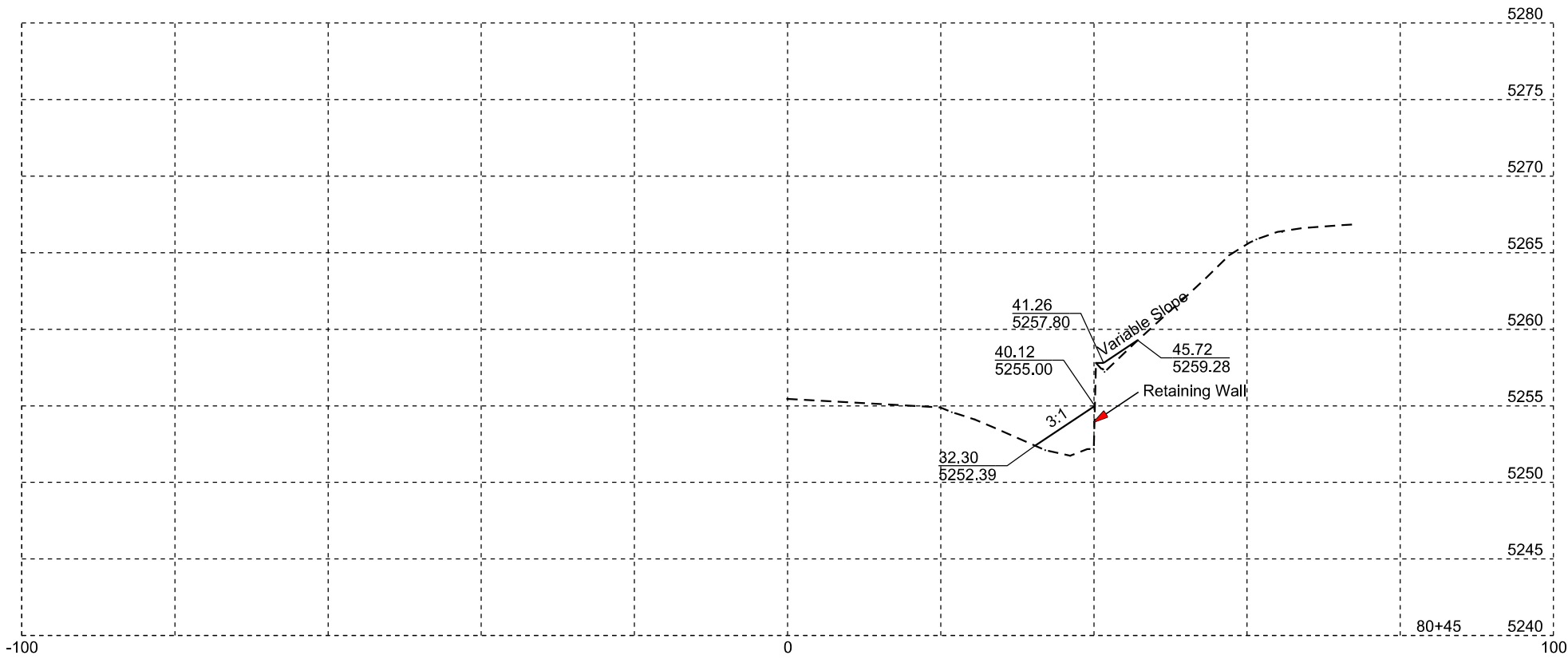
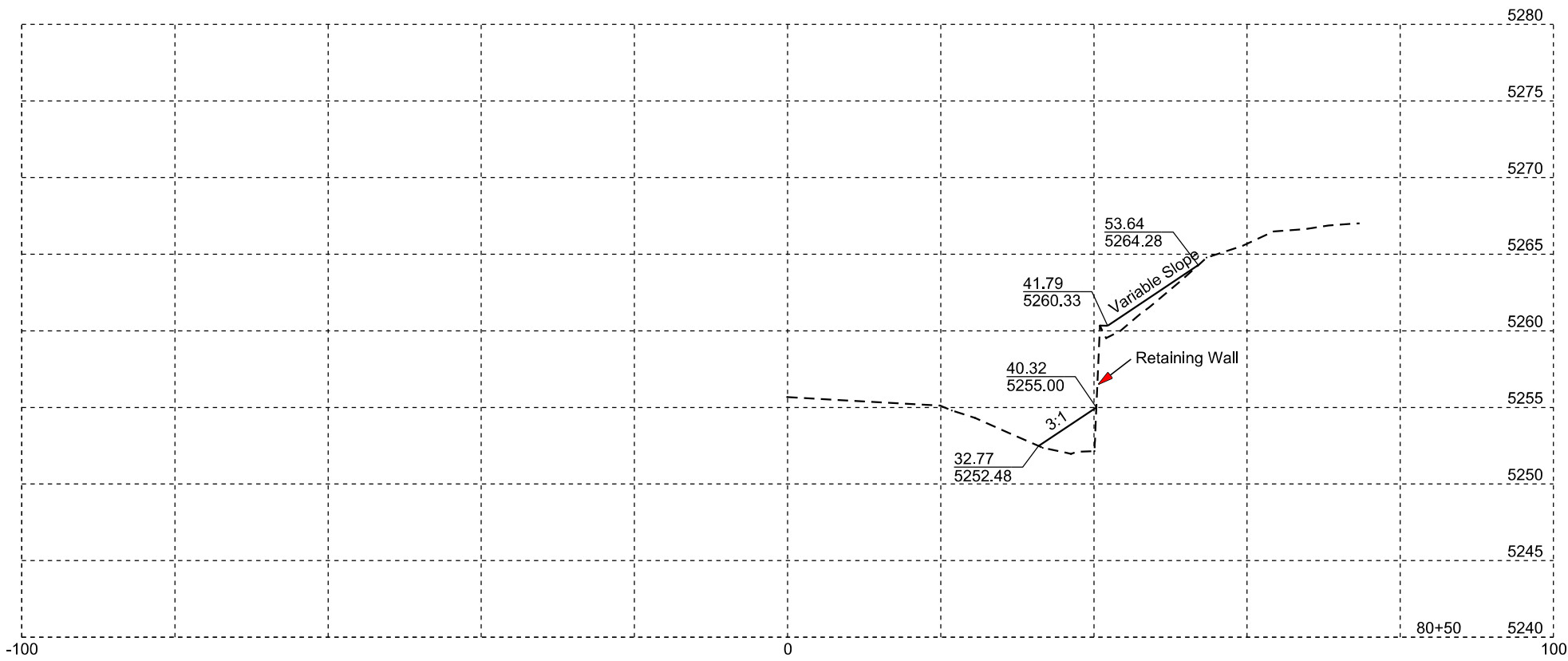
Plotted From - trrc11610

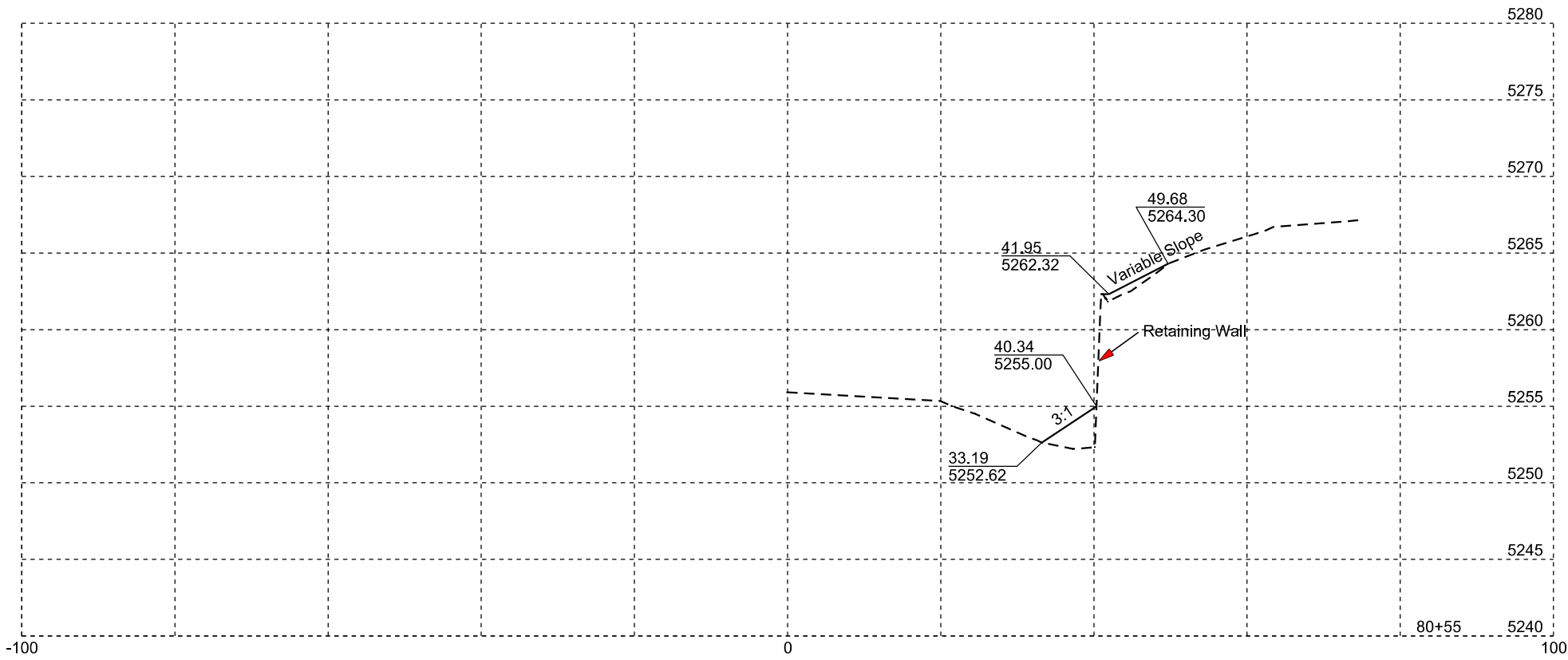
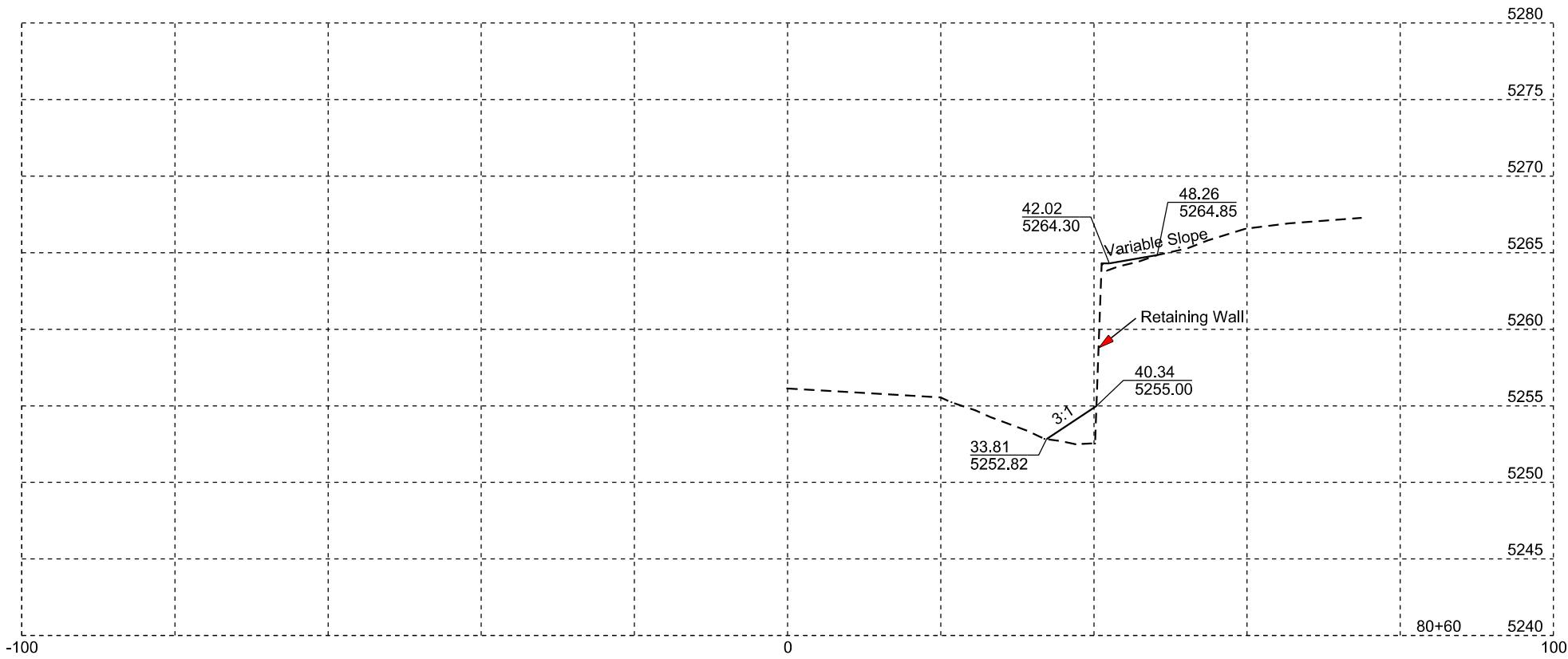
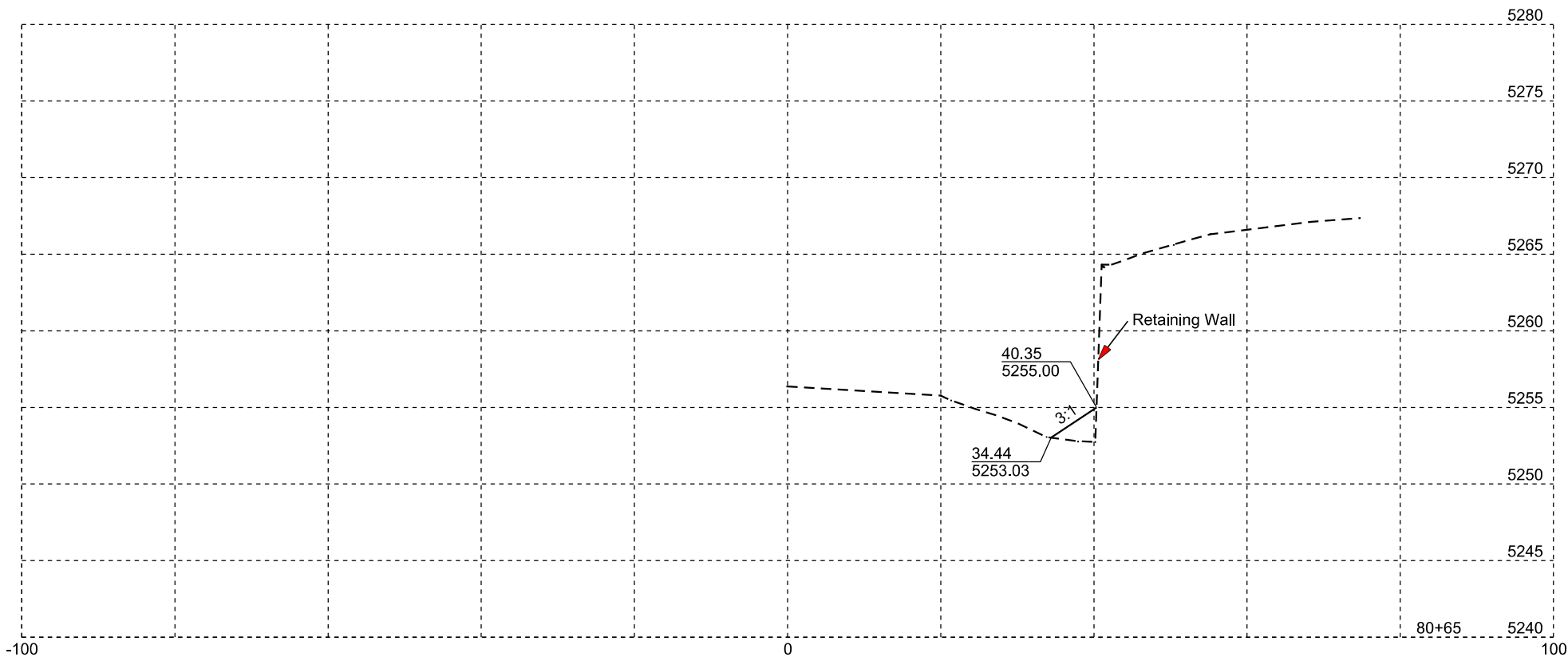
SHEET	TOTAL SHEETS
19	25

QUANTITIES	
MSE WALL	1793.5 SF
- 46.4 SF CAP UNIT	
- 1747.1 SF STANDARD UNIT	
REINFORCEMENT	1578 SY
GRANULAR BACKFILL	977 CY
STRUCTURE EXCAVATION	1386 CY
4" UNDERDRAIN	231 FT
BASE COURSE	353 TON
FOOTING UNDERCUT	201 CY
PRECAST UNDERDRAIN HEADWALL	1 EA

[illegible]

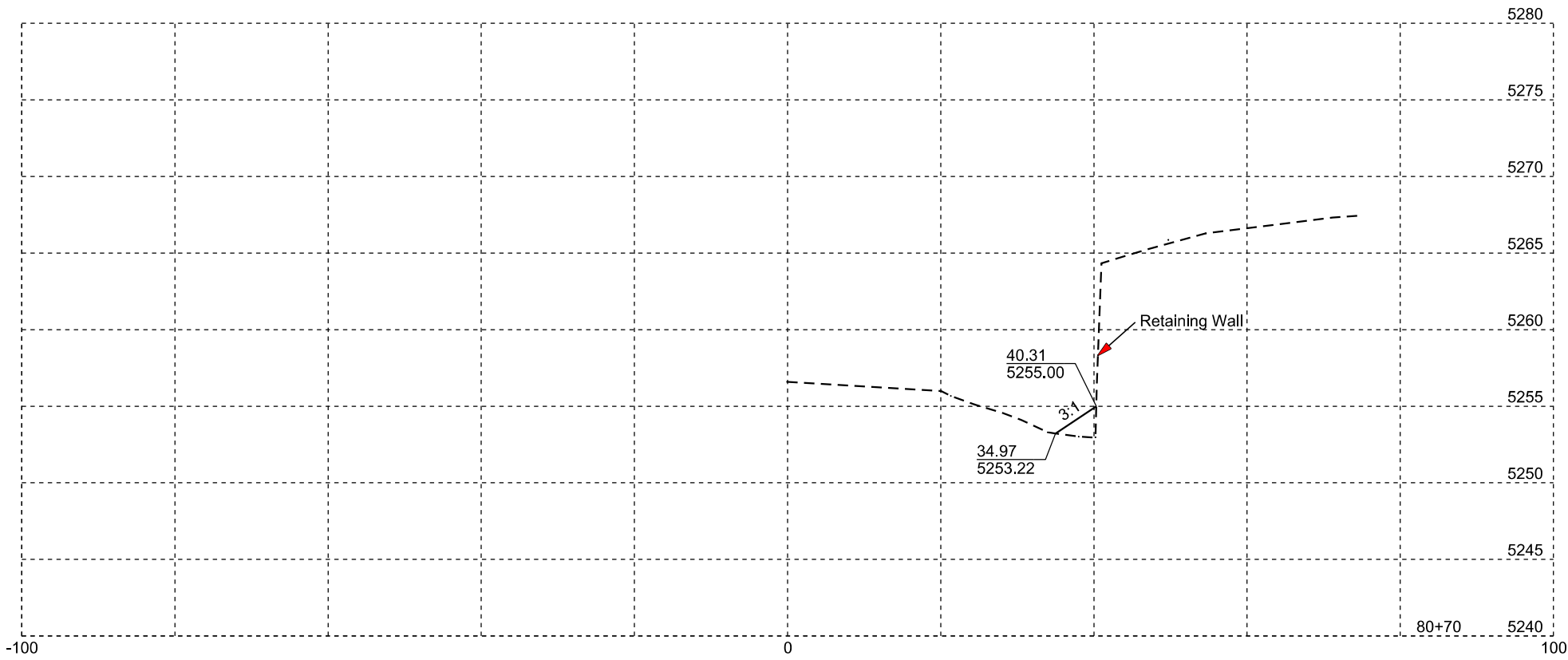
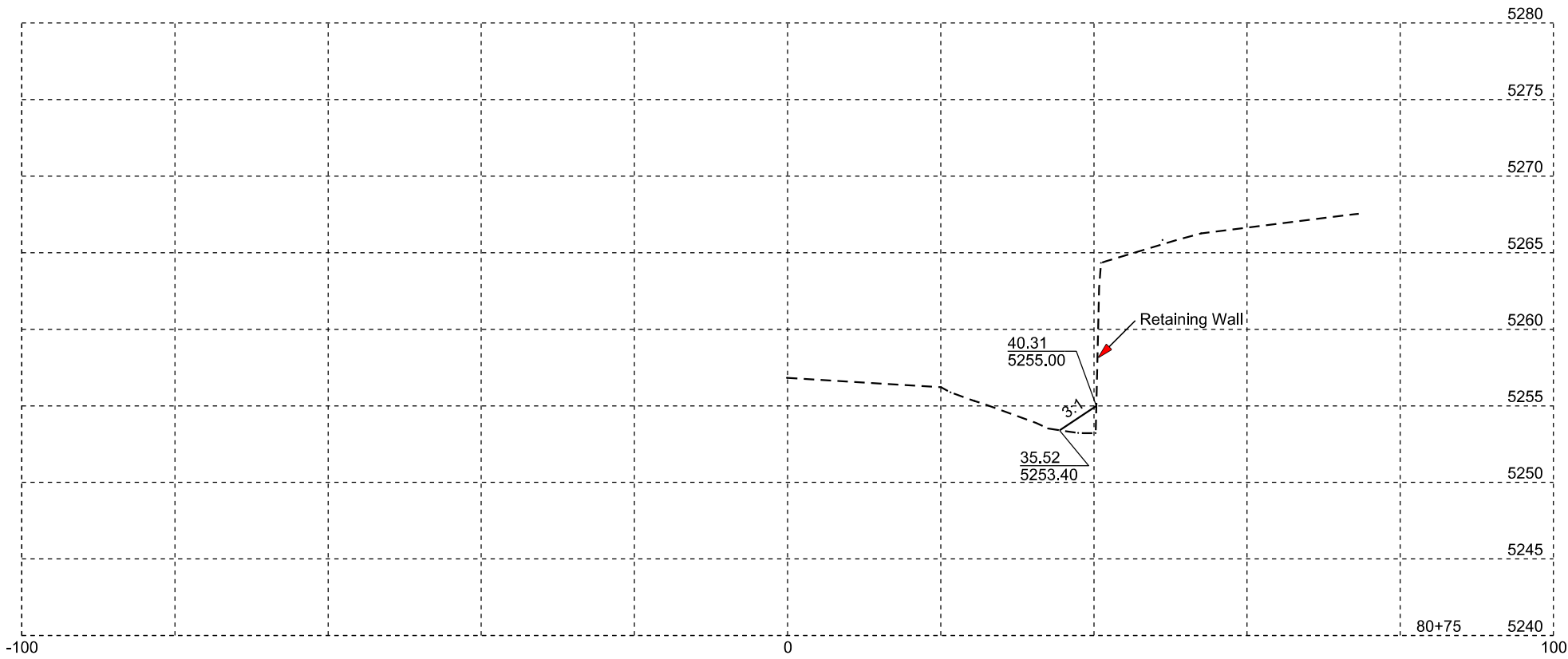
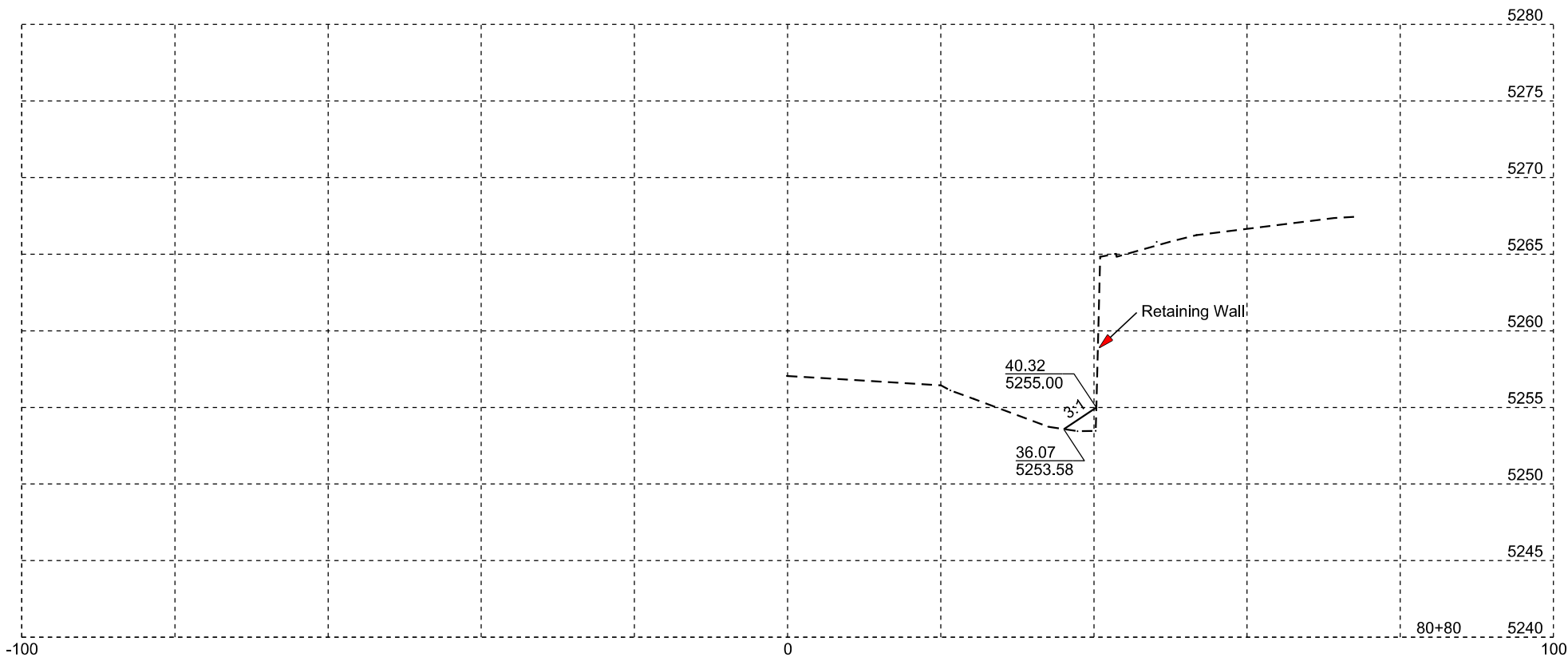


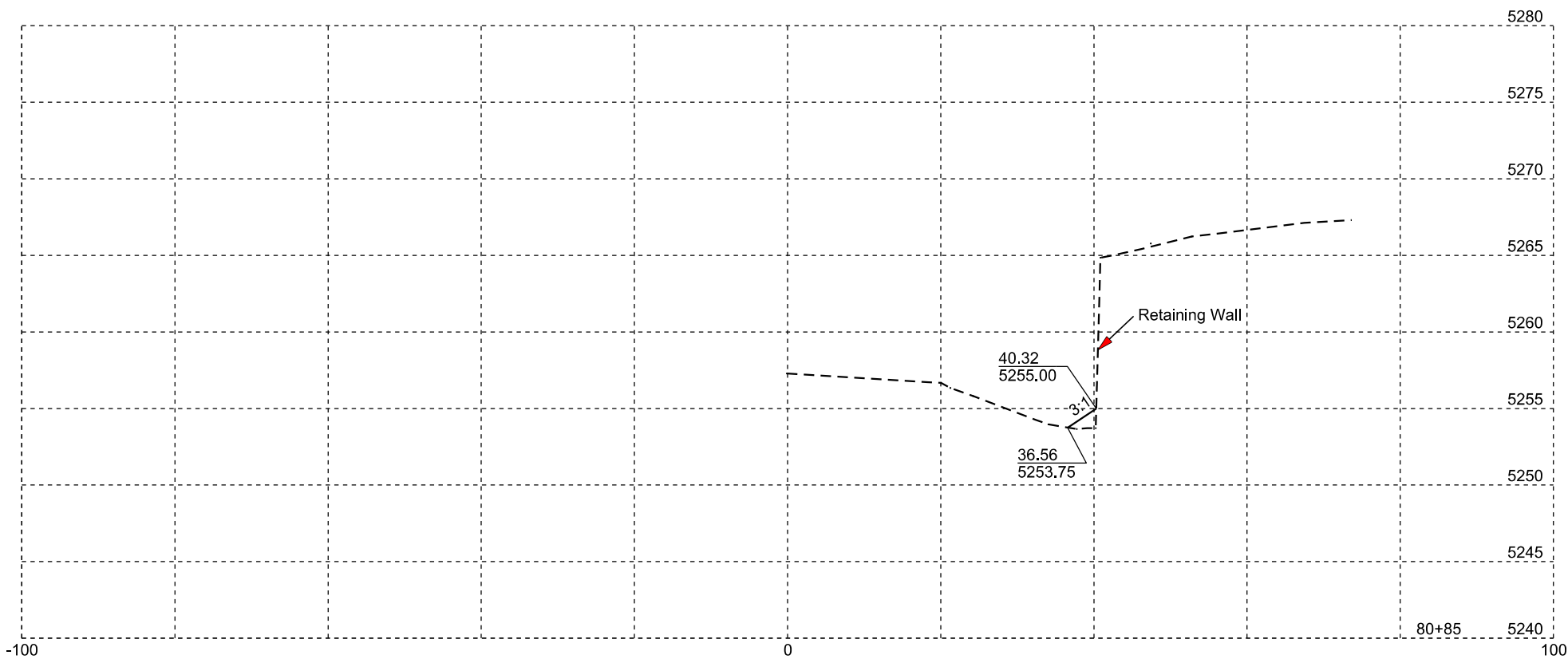
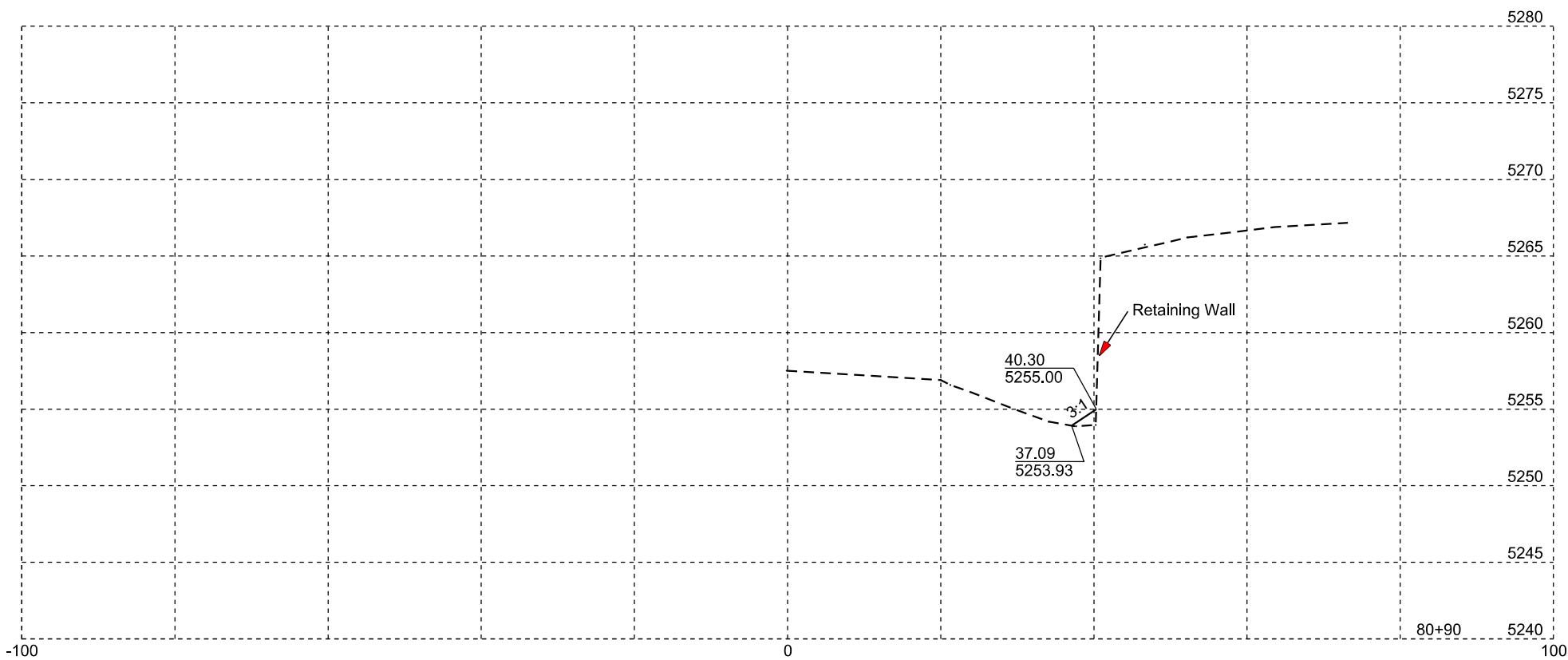
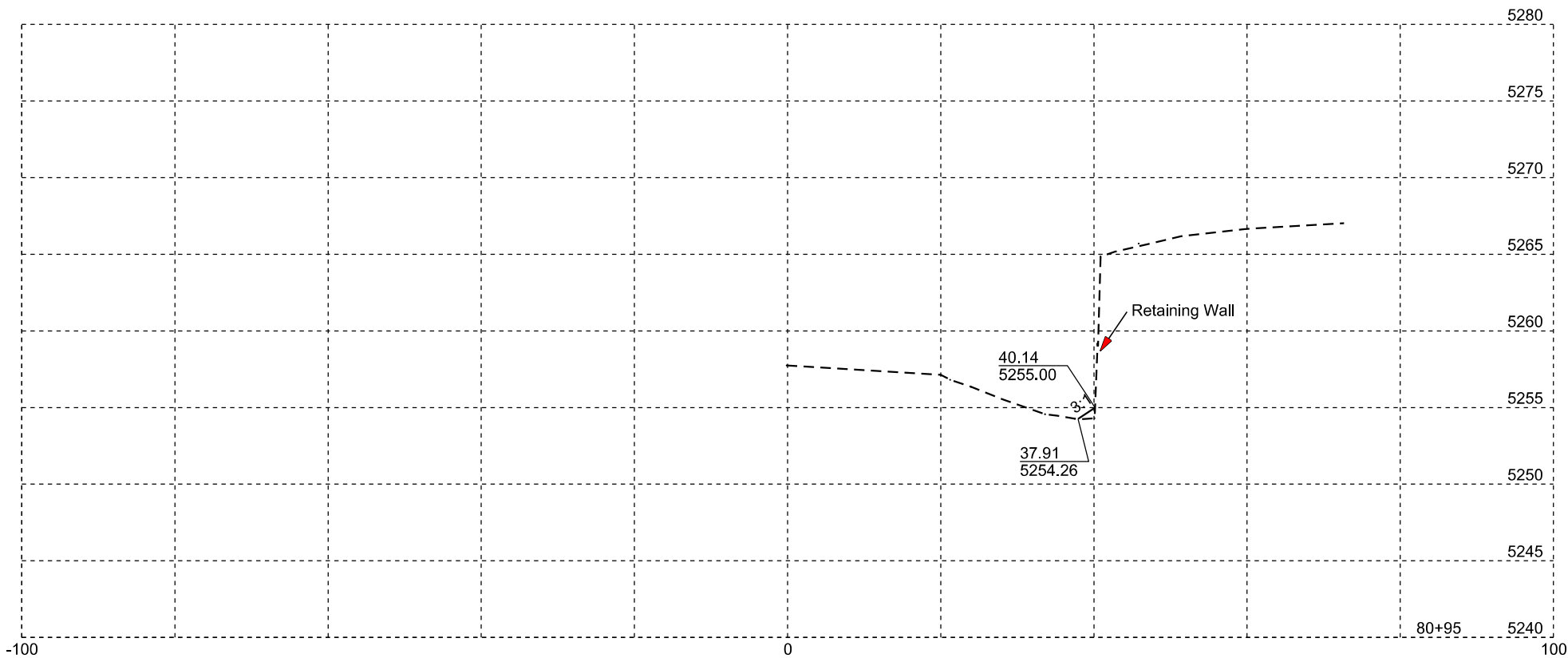




Plotting Date: 09/03/2013

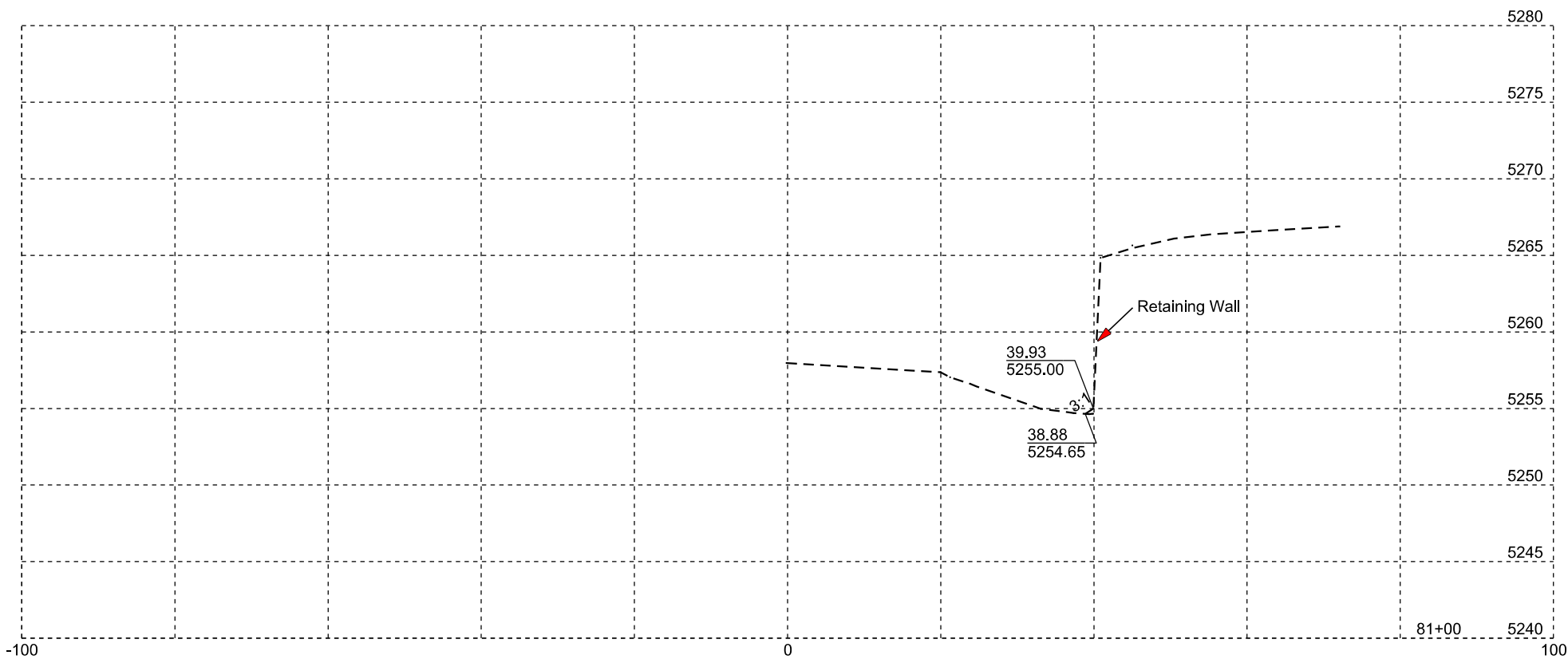
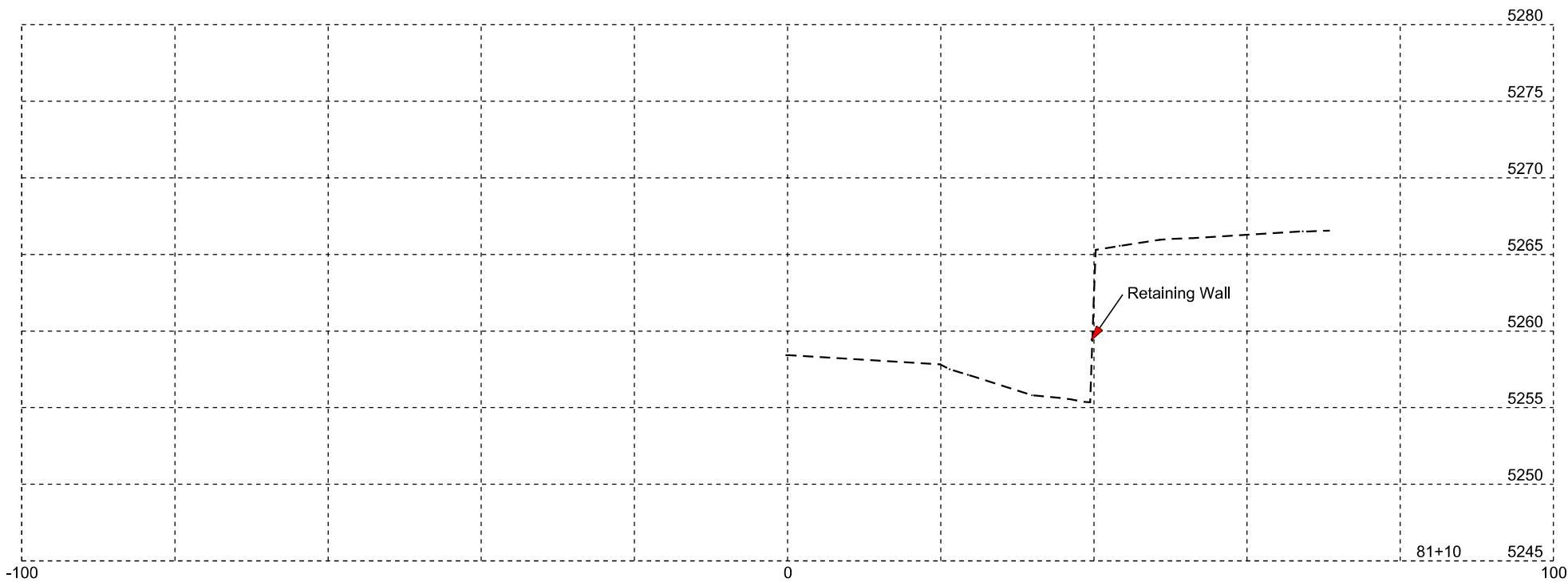
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO. 22	TOTAL SHEETS 25
	385-451		





Plotting Date: 09/03/2013

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	385-451	24	25



Plotting Date: 09/03/2013

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	385-451	25	25