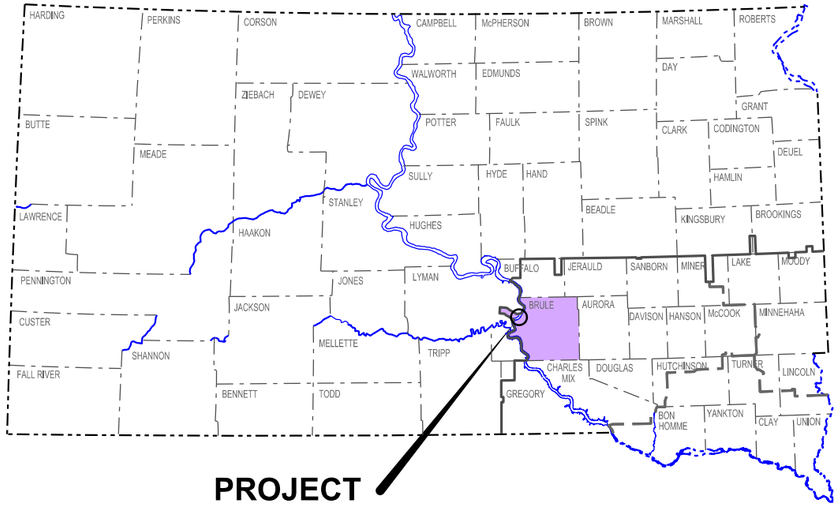


PLOT SCALE - 1:7000

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

PROJECT IM 0905(107)259
INTERSTATE 90
LYMAN & BRULE COUNTIES

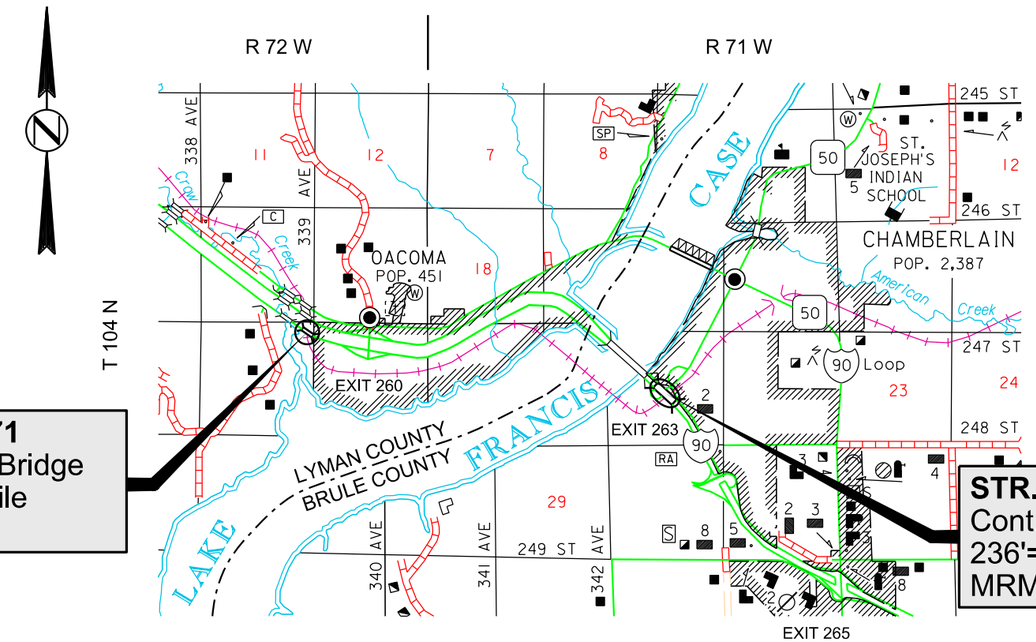
BRIDGE BERM REPAIR, RETAINING WALL
& STRIP DRAIN

PCN 04TD

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0905(107)259	1	72

Plotting Date: 06/13/2014

INDEX OF SHEETS



STR. NO. 43-479-271
Cont. Comp. Girder Bridge
192'-3 3/4"=0.036 Mile
MRM 259.90 EBL

STR. NO. 08-065-095
Cont. Comp. Girder Bridge
236'=0.045 Mile
MRM 263.53 EBL & WBL

ADT (2013) (Str. No. 43-479-271) 3230
ADT (2013) (Str. No. 08-065-095) 7060

STORM WATER PERMIT
(None required)

PLOTTED FROM - TRM111118

PLOT NAME - 1

FILE - ...\PRJ2014\LYMN04TD\TITL04TD.DGN

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0905(107)259	2	72

ESTIMATE OF QUANTITIES

STR. NO. 43-479-271

Bid Item Number	Item	Quantity	Unit
260E1010	Base Course	78.0	Ton
530E0470	Gravity Large Concrete Block Wall	1,100	SqFt
530E0718	Granular Backfill for Gravity Large Concrete Block Wall	272.2	CuYd
680E0240	4" Corrugated Polyethylene Drainage Tubing	92	Ft
680E0440	4" Slotted Corrugated Polyethylene Drainage Tubing	100	Ft
680E2010	Precast Concrete Headwall for Drain	1	Each
680E2500	Porous Backfill	24.0	Ton
680E6036	36" Strip Drain	50	Ft
700E0110	Class A Riprap	358.0	Ton
831E0210	Non-woven Geotextile Separator	505	SqYd

STR. NO. 08-065-095

Bid Item Number	Item	Quantity	Unit
680E0240	4" Corrugated Polyethylene Drainage Tubing	30	Ft
680E2010	Precast Concrete Headwall for Drain	1	Each
680E6036	36" Strip Drain	70	Ft

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
110E0400	Remove Drop Inlet	1	Each
110E0500	Remove Pipe Culvert	262	Ft
110E0510	Remove Pipe End Section	1	Each
110E0600	Remove Fence	180	Ft
110E1690	Remove Sediment	2.0	CuYd
120E0010	Unclassified Excavation	2,699	CuYd
120E0600	Contractor Furnished Borrow	680	CuYd
230E0010	Placing Topsoil	290	CuYd
450E4769	24" CMP 16 Gauge, Furnish	78	Ft
450E4770	24" CMP, Install	78	Ft
450E5015	24" CMP Elbow, Furnish	2	Each
450E5016	24" CMP Elbow, Install	2	Each
450E5215	24" CMP Flared End, Furnish	1	Each
450E5216	24" CMP Flared End, Install	1	Each
462E0200	Controlled Density Fill	22.8	CuYd
462E0250	Cellular Grout	8.9	CuYd
620E0020	Type 2 Right-of-Way Fence	180	Ft
620E1020	2 Post Panel	1	Each
620E1030	3 Post Panel	1	Each
634E0010	Flagging	20	Hour
634E0100	Traffic Control	1,494	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0330	Raised Pavement Markers	1,800	Ft
634E0420	Type C Advance Warning Arrow Panel	2	Each
700E0210	Class B Riprap	8.4	Ton
734E0010	Erosion Control	Lump Sum	LS
734E0042	Soil Stabilizer	2,000.0	SqYd
734E0154	12" Diameter Erosion Control Wattle	890	Ft
831E0110	Type B Drainage Fabric	19	SqYd
998E0100	Railroad Protective Insurance	Lump Sum	LS

SPECIFICATIONS

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

ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0905(107)259	3	72

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 B4: BALD EAGLE

Bald eagles are known to occur in this area.

Action Taken/Required:

If a nest is observed within one mile of the project site, notify the Project Engineer immediately so that he/she can consult with the Environmental Office for an appropriate course of action.

COMMITMENT C: WATER SOURCE

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

Action Taken/Required:

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

COMMITMENT E: STORM WATER

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 State ROW.

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

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

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

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

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

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

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

COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES

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

Action Taken/Required:

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

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

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

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

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

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

RAILROAD CROSSING

The successful bidder will be required to obtain a temporary right of entry & occupancy permit prior to entering the railroad ROW at Str. No. 43-479-271 (I90 EB Structure, 0.5 mile west of Exit 260 at Oacoma) and Str. No. 08-065-095 (I90 Structure at Exit 263 in Chamberlain). Bidders may contact Lynn Kennison with the Office of Air, Rail and Transit at 605-773-3222.

The Contractor is to coordinate work with the Railroad Company regarding any work to be done adjacent to the railroad tracks and give 30 days notice to the Railroad Company in advance of required flagging dates. See Special Provision for Working on Railroad Company Right of Way.

CLASSIFICATION OF EXCAVATION

All materials encountered during the construction of this project, regardless of their nature or the manner in which they are excavated, will be considered Unclassified Excavation.

Most of the material encountered will consist of shale derived soil mixed with granular materials and should be able to be excavated using conventional methods. Prospective bidders are encouraged to review the boring information and geology report compiled by the SDDOT Geotechnical Engineering Activity as well as observe the project conditions in the field. The geology report is available at the Mitchell Area Office.

LANDSLIDE DEBRIS EXCAVATION

Landslide Debris Excavation will be required at both sites as shown on the cross sections. It is anticipated that the excavated Landslide Debris will be used in embankment construction. Borrow may be required to construct the remaining embankment. The Landslide Debris Excavation limits shall not exceed those shown on the cross sections unless directed by the Engineer. The temporary backslopes required to excavate Landslide Debris will become unstable over the long-term. However, the temporary 1 ½:1 or 2:1 excavated backslopes should remain globally stable over the short-term during construction provided that measures are taken to divert runoff away from the slope and regular monitoring of the slope is conducted. Construction activities shall be sequenced to minimize the amount of time the steep temporary backslopes are left exposed and unsupported. Landslide Debris Excavation shall be paid for as Unclassified Excavation.

UNSTABLE EXCAVATION AND BACKFILL

Unstable Excavation will be required at the Oacoma site from Station 0+00± to Station 1+45± to remove saturated or weak compressible soils from the proposed wall and embankment footprints. A nominal 3 ft. depth of compressible material is anticipated to be excavated from each footprint prior to construction of the wall and embankment. The depth of unstable excavation may be adjusted by the Engineer to ensure a solid foundation free of organic, soft, unstable material is prepared. Unstable and/or highly organic material shall be stockpiled for use as topsoil or wasted at a site approved by the Engineer. Unstable Excavation shall be paid for as Unclassified Excavation.

The excavation from Station 0+45± to Station 1+45± shall be backfilled with 3 feet of compacted Class A Riprap covered with Non-woven Geotextile Separator Fabric. Twenty tons of Granular Base Course shall be included in the estimate for leveling and preparing the riprap surface for fabric placement. The riprap shall be shaped and compacted to provide a relatively smooth, level surface for placement of the Separator Fabric and backfill as outlined below:

UNSTABLE EXCAVATION AND BACKFILL (CONTINUED)

Typical Installation Procedure

1. Shape and compact riprap to provide to a relatively smooth, level surface. Fill voids and level riprap surface with Granular Base Course. Any protrusions that might damage the geotextile will be removed prior to placing the geotextile.
2. The Non-Woven Separator Fabric shall be placed directly on and completely cover the area backfilled with Class A Riprap.
3. The geotextile should be kept as taut as possible prior to backfilling.
4. All seams in the geotextile shall be overlapped at least 2 feet and shingled in a manner that assures that material will not be forced under the geotextile during backfilling operations.
5. Backfill material shall be dumped behind the leading edge of the fill and pushed into place with a loader or dozer.
6. No equipment shall be allowed on the geotextile until the backfill material has been placed.

The Separator Fabric will conform to Section 831.1.A, Non-Woven Geotextile Separator.

Non-Woven Geotextile Separator will be paid for at the contract unit price per sq. yd. for Non-woven Geotextile Separator. Payment quantities will be based on area covered plus 15%. Overlaps are accounted for by the additional 15%. Payment will be full compensation for furnishing and installing the Non-Woven Geotextile Separator only. Backfill materials will be paid for as Class A Riprap and Unclassified Excavation.

Estimated Quantity for **Non-woven Geotextile Separator (831E0210) is 335 Sq. Yds**.

Estimated Quantity for **Class A Riprap (700E0110) is 358 Tons.**

Estimated Quantity of **Granular Base Course (260E1010) for Leveling is 20 Tons.**

SEPARATOR FABRIC FOR GRANULAR BACKFILL

The Granular Backfill used for the Gravity Large Concrete Block Retaining Wall shall be covered with Non-woven Geotextile Separator Fabric.

The Non-Woven Separator Fabric shall be placed directly on and completely cover the area backfilled with Granular Backfill. The geotextile should be kept as taut as possible prior to backfilling. All seams in the geotextile shall be overlapped at least 2 feet and shingled in a manner that assures that material will not be forced under the geotextile during backfilling operations. Backfill material shall be dumped behind the leading edge of the fill and pushed into place with a loader or dozer.

No equipment shall be allowed on the geotextile until the backfill material has been placed.

The Separator Fabric will conform to Section 831.1.A, Non-Woven Geotextile Separator.

Non-Woven Geotextile Separator will be paid for at the contract unit price per sq. yd. for Non-woven Geotextile Separator. Payment quantities will be based on area covered plus 15%. Overlaps are accounted for by the additional 15%. Payment will be full compensation for furnishing and installing the Non-Woven Geotextile Separator only.

Estimated Quantity for **Non-woven Geotextile Separator (831E0210) is 170 Sq. Yds**.

TABLE OF EXCAVATION QUANTITIES BY BALANCES

Location	Excavation (CuYd)	* Contractor Furnished Borrow (CuYd)	Total Excavation (CuYd)	** Waste (CuYd)
43-479-271	1958	680	2638	-
08-065-095	741	-	741	32
Totals:	2699	680	3379	32

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

TABLE OF UNCLASSIFIED EXCAVATION

43-479-271 Berm Excavation	1499
Ditch Diversion Excavation	244
08-065-095 Excavation	666
43-479-271 Berm & Ditch Diversion	215
Topsoil	
08-065-095 Topsoil	75
Total	2699

PROCEDURES FOR DETERMINING UNCLASSIFIED EXCAVATION QUANTITY

When plan quantities are used for payment, the Unclassified Excavation quantity shall be used for final payment. If final cross sections are taken in the field, add all of the items in the Table of Unclassified Excavation using the following procedures:

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

EMBANKMENT CONSTRUCTION

Embankment construction shall not begin until all vegetation and unstable compressible materials have been excavated from the embankment footprint to the satisfaction of the Engineer. A suitable embankment foundation consists of compacted soil which does not pump, rut, or otherwise displace when traveled over with construction equipment. Embankment material shall be free of debris and organic material. Each embankment shall be benched into the existing slopes in accordance with Section 120.3.B.1 of the Specifications. Compaction of the embankment will be according to the Specified Density Method. Minimum density testing requirements shall be one test per zone per site. Each zone shall be 3 feet in depth. Moisture testing shall remain as per Minimum Sample Testing Requirements.

CONTRACTOR FURNISHED BORROW

Borrow may be required to reconstruct the bridge berms at each site. Soil needed to reconstruct the berm slope shall be furnished by the Contractor. The soil will have a maximum of 70% passing the #4 sieve, have a maximum Liquid Limit (LL) of 45 and Plastic Limit (PI) greater than 10 but less than 25. The contractor shall be responsible for one gradation, LL and PI test for each borrow source for berm reconstruction. The results shall be supplied to the Engineer in writing.

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.

SHRINKAGE FACTOR: Embankment +35%

UNDERDRAIN

For the reconstruction of the berm at Str. No. 43-479-271, an underdrain system shall be installed from Sta. 0+45± - 20' Rt. to Sta. 1+45± – 20' Rt. (RR Alignment) and outlet at Sta. 0+58 (RR Alignment) thru an existing 30" RCP (see plans and cross sections for details).

The underdrain system will consist of 4 inch slotted corrugated polyethylene tubing placed in the bottom of a 2 foot wide trench of variable depth backfilled with Porous Backfill. The underdrain trench shall be a minimum of 1 foot deep and shall drain toward the railroad culvert at Sta. 0+58 (RR Alignment) maintaining a minimum 0.01 ft/ft or 1% drop from each end. The underdrain shall outlet through 52' of 4" Corrugated Polyethylene Tubing placed through the existing railroad culvert and grouted in place. Tee the Slotted Tubing to the Solid Outlet Tubing. The underdrain outlet tubing shall daylight at the existing culvert outlet headwall on the West side of the railroad tracks as directed by the Engineer. Provide a rodent screen on the end of outlet tubing. The 19 cubic yards of excavation the 4 inch polyethylene tee connector and rodent screen shall be incidental to the contract unit price per foot for the corresponding Polyethylene Tubing bid items.

The estimated quantities for the underdrain system are as follows:

4" Corrugated Polyethylene Tubing	52	Ft
4" Slotted Corrugated Polyethylene Tubing	100	Ft
4" Polyethylene Tee Connector	1	Each
Porous Backfill	22	Ton
Excavation	19	CuYd

STRIP DRAIN

After completion of the bridge berms, the Contractor shall install a strip drain against the bridge abutment backwall. The strip drain shall consist of a 1" thick 36" wide fabric wrapped double sided drainage core consistent with American Wick Drain – Sitedrain Strip 6000 or equivalent. The strip drain shall be placed against the backwall in a trench extending from 6" above the bottom of the backwall to 2½' below the bottom of the backwall. Void space under the backwall shall be backfilled with Porous Backfill. The remainder of the trench in front of and over the strip drain shall be backfilled with soil and compacted. Connect the strip drain to the outlet tubing using a universal end outlet or other approved outlet connector. The strip drain shall outlet through a 4" Corrugated Polyethylene Tubing placed in a 2 foot wide trench of variable depth backfilled with fill material. The underdrain outlet tubing shall daylight at an Outlet Headwall.

STRIP DRAIN (CONTINUED)

At 1+94 for Str. No. 08-065-095 Tee the in place 4" Corrugated Polyethylene Tubing, located in the middle of the abutment backwall, into the Strip Drain.

The excavation and the connection between the 36" Strip Drain and Polyethylene Tubing shall be incidental to the contract unit price per foot for the corresponding Polyethylene Tubing bid items.

The estimated quantities for the strip drain at Str. No. 43-479-271 are as follows:

36" Strip Drain	50	Ft
Porous Backfill	2	Ton
36" Universal End Outlet	1	Each
4" Corrugated Polyethylene Tubing	40	Ft
Headwall (See Standard Plate No. 680.03)	1	Each

The estimated quantities for the strip drain at Str. No. 08-065-095 are as follows:

36" Strip Drain	70	Ft
36" Universal End Outlet	1	Each
4" Corrugated Polyethylene Tubing	30	Ft
Headwall (See Standard Plate No. 680.03)	1	Each

CELLULAR GROUT

Pressure grouting shall be done to ensure all the voids are filled between the 4" Solid Polyethylene Drainage Tubing and the existing pipe including all breaks or holes in and around the existing pipe. Grouting pressures used shall ensure all voids are filled, but do not collapse or deform the drainage tubing more than 5 percent of the diameter.

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

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

The Contractor shall install a bypass valve adjacent to the location where the pressure grouting hose is attached for obtaining samples to be checked for wet density. The wet density of the cellular grout shall be checked by the Contractor to verify the proper minimum wet density before the cellular grout filling operations begin and at a minimum once every two hours during production. The SDDOT shall document the results of the density checks.

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

CELLULAR GROUT (CONTINUED)

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

The quantity of cellular grout was estimated based on void quantity between the drainage tubing and the existing pipe, and an additional quantity if necessary was estimated for the void volume outside the existing pipe.

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

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

CONTROLLED DENSITY FILL

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

Mix Design:

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

Alternative Mix Design with Controlled Low Strength Material (CLSM):

Material	Rate per Cubic Yard	
Portland Cement, Type I	200 Lb	
Fine Aggregate	2,600 Lb	
Coarse Aggregate	None	
Water	35 Gal	
W.R. Grace - Darafill (or approved equal)	1 (3 oz.)* capsule	(or equivalent)

* One 3oz. Darafill capsule or equivalent CLSM performance additive (foaming admixture).

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

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

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

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

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

CONTROLLED DENSITY FILL (CONTINUED)

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

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

DITCH RESTORATION

At Str. No. 43-479-271, the ditch shall be excavated as directed by the Engineer from the edge of the placement of Embankment at Sta. 0+00 (RR Alignment) south to the in place 30" RCP to obtain proper water flow to the 30" pipe. The excavated material may be used as embankment as approved by the Engineer.

Cost for this work shall be incidental to the contract unit price per cubic yard for Unclassified Excavation.

PLACING TOPSOIL

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

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

Location	Topsoil (CuYd)
Str. No. 43-479-271	215
Str. No. 08-065-095	75
Total:	290

TABLE OF FENCE QUANTITIES

STRUCTURE	REMOVE FENCE FEET	TYPE 2 ROW FENCE FEET	2 POST PANEL EACH	3 POST PANEL EACH
43-479-271	180	180	1	1
TOTALS:	**180**	**180**	**1**	**1**

PERMANENT SEEDING AND MULCHING

The areas to be seeded and mulched include all disturbed areas within the right-of-way resulting from the work required by this contract.

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

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

The varieties listed for seed mixtures are preferred varieties.

Native harvest seed will be allowed.

Type C Permanent Seed Mixture shall consist of the following:

Grass Species	Variety	Pure Live Seed (PLS) (Pounds/Acre)
Western Wheatgrass	Flintlock, Rodan, Rosana	16
Canada Wildrye	Mandan	2
	Total:	18

PERMANENT SEEDING AND MULCHING (CONTINUED)

Application of fertilizer will not be required on this project.

Bales with noxious weed contamination will be rejected and the Contractor will be required to remove the contaminated bales from the project.

The areas to be seeded and mulched are estimated at 0.8 acre.

Cost for seeding and mulching shall be incidental to the contract lump sum price for Erosion Control.

DRILLS

In addition to the drills specified in Section 730 of the Specifications, other types of drills including no-till drills will be allowed as long as they have baffles, partitions, agitators, or augers which keep the seed distributed throughout the seed box and the seed is planted at a depth of ¼" to ½".

MYCORRHIZAL INOCULUM

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

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

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

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

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

SOIL STABILIZER

An estimated quantity of 2000 square yards of soil stabilizer has been included in the Estimate of Quantities. The soil stabilizer shall be applied on permanently seeded areas and areas deemed necessary by the Engineer.

The Contractor shall apply soil stabilizer according to the manufacturer's application instructions and at the rate specified in the list of approved soil stabilizers.

Wood fiber mulch that contains a green dye shall be mixed with the soil stabilizer to be used as a tracer when the soil stabilizer is applied hydraulically. Wood fiber mulch shall be added at a rate of 300 pounds per acre to all of the approved soil stabilizers listed in the table except for the Pam-12 Plus product. The wood fiber mulch shall be a 100% wood fiber product and does not need to contain a tackifier.

All costs for furnishing and applying the soil stabilizer including wood fiber mulch, hauling, materials, equipment, labor, and incidentals necessary shall be paid for at the contract unit price per Square Yard for Soil Stabilizer.

SOIL STABILIZER (CONTINUED)

The soil stabilizer shall be from the list below or an approved equal:

Product	Manufacturer
StarTak 600 Applied at a rate of 150 Lb/Acre	Chemstar Products Company Minneapolis, MN Phone: 1-800-328-5037 www.chemstar.com
Pam-12 Plus Applied at a rate of: Slope: None to 4:1 — 1000 Lb/Acre; 4:1 to 3:1 — 1000 to 2000 Lb/Acre; 3:1 to 2:1 — 2000 to 3000 Lb/Acre	ENCAP, LLC Green Bay, WI Phone: 1-877-405-5050 http://professional.encap.net/
M-Binder Applied at a rate of 150 Lb/Acre	Ecology Controls Carpinteria, CA Phone: 1-805-684-0436 www.ssseeds.com
FiberRX Applied at a rate of: Slope: None to 4:1 — 50 Lb/Acre; 3:1 — 60 Lb/Acre; 2:1 — 70 Lb/Acre; 1:1 or steeper — 80 Lb/Acre	Hydrostraw, LLC Manteno, IL Phone: 1-800-545-1755 http://hydrostraw.com/
Enviropam Applied at a rate of 9 Lb/Acre	Innovative Turf Solutions, LLC Cincinnati, OH Phone: 1-513-317-8311 www.innovativeturfsolutions.com
HydraTack, Tack Plus, Tack-P, or Tack-P Plus Applied at a rate of 30 Lb/Acre	Innovative Turf Solutions, LLC Cincinnati, OH Phone: 1-513-317-8311 www.innovativeturfsolutions.com
Fl-1045 Hydrobond or Fl-1046 Hydrobond Applied at a rate of 15 Lb/Acre	JRM Chemical, Inc. Cleveland, OH Phone: 1-216-475-8488 www.soilmoist.com
HF5000 Tack Applied at a rate of 60 Lb/Acre	Rantec Corporation Ranchester, WY Phone: 1-307-655-9565 www.ranteccorp.com
R-Tack Applied at a rate of 150 Lb/Acre	Rantec Corporation Ranchester, WY Phone: 1-307-655-9565 www.ranteccorp.com

SOIL STABILIZER (CONTINUED)

SpecTac Applied at a rate of: Slope		Rantec Corporation Ranchester, WY Phone: 1-307-655-9565 www.ranteccorp.com
None	30 to 80 Lb/Acre	
4:1	50 to 100 Lb/Acre	
3:1	80 to 120 Lb/Acre	
2:1	100 to 170 Lb/Acre	
Super Tack Applied at a rate of 60 Lb/Acre		Rantec Corporation Ranchester, WY Phone: 1-307-655-9565 www.ranteccorp.com
EarthGuard SFM Applied at a rate of 60 LB/Acre (approx. 6 Gallons/Acre)		Terra Novo Inc. Bakersfield, CA Phone: 1-661-747-5956 www.terranovo.com

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:

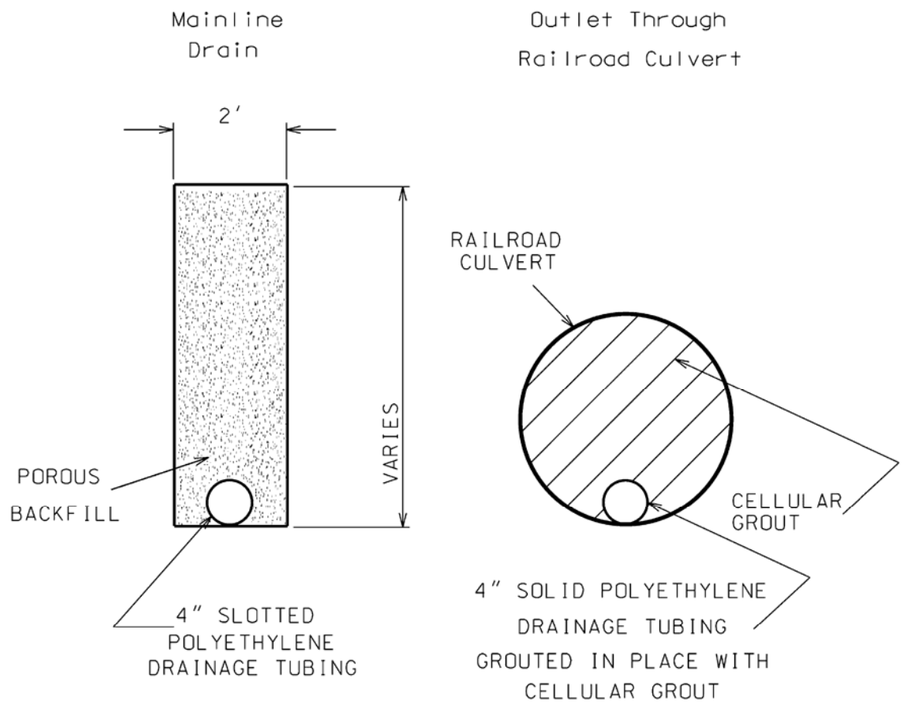
http://sddot.com/business/certification/products/Default.aspx

TABLE OF EROSION CONTROL WATTLE

Structure	Diameter (Inch)	Quantity (Ft)
43-479-271	12	605
08-065-095	12	285
	Total:	890

TYPICAL UNDERDRAIN INSTALLATION

Oacoma Wall Foundation Drain



UNDERDRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 680 OF THE SPECIFICATIONS

MAINTENANCE OF TRAFFIC

Removing, relocating, covering, salvaging and resetting of permanent traffic control devices, including delineation, shall be the responsibility of the Contractor. Cost for this work shall be incidental to the contract unit prices for the various items unless otherwise specified in the plans. Any delineators and signs damaged or lost shall be replaced by the Contractor at no cost to the State.

Storage of vehicles and equipment shall be outside the clear zone and as near as possible to the right-of-way line. 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 to 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.

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

Sufficient traffic control devices have been included in these plans to provide two workspaces.

Work activities shall not be conducted simultaneously on the median and outside shoulders of the same directional set of lanes.

The use of interstate maintenance crossovers will not be permitted.

Due to the Sturgis Motorcycle Rally, no lane closures will be allowed (except for emergency repair) in the:

- Westbound lanes of I90 from Friday, July 31 through Friday, August 7.
- Eastbound lanes of I90 from Thursday, August 6 through Monday, August 10.

REDUCED SPEED LIMITS

The R2-1 Speed Limit 45 and W3-5 Speed Reduction (45 MPH) signs are to be used for manned work spaces. When no work is being performed within a lane closure, the R2-1 Speed Limit 45 and W3-5 Speed Reduction (45 MPH) signs shall be replaced with R2-1 Speed Limit 65 and corresponding W3-5 Speed Reduction sign. The signs shall be installed in advance of the lane closure taper and the minimum spacing between signs shall be 500'.

RAISED PAVEMENT MARKERS

Raised Pavement Markers shall be used on closure tapers and temporary edgelines.

Raised Pavement Markers shall be attached to the roadway surface with a bituminous adhesive capable of being removed from the roadway surface. Cost for furnishing, installing, maintaining (including cleaning and replacing, if necessary), removing markers and bituminous adhesive shall be included in the contract unit price per foot (4" equivalent) for Raised Pavement Markers.

ITEMIZED LIST FOR TRAFFIC CONTROL

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
E5-1	36" x 32"	EXIT GORE SIGN		24	
G20-2	36" x 18"	END ROAD WORK		17	
G20-2	48" x 24"	END ROAD WORK	2	24	48
R1-1	48" x 48"	STOP		34	
R1-2	48" x 48"	YIELD		34	
R2-1	30" x 36"	SPEED LIMIT __		23	
R2-1	30" x 36"	SPEED LIMIT 45	4	23	92
R2-1	36" x 48"	SPEED LIMIT 65	4	29	116
R2-1	36" x 48"	SPEED LIMIT 75	2	29	58
R2-1	48" x 60"	SPEED LIMIT __		38	
R2-6aP	36" x 24"	FINES DOUBLE (PLAQUE)	4	20	80
R4-7	24" x 30"	KEEP RIGHT (SYMBOL)		18	
R5-1	48" x 48"	DO NOT ENTER		34	
R5-1a	42" x 30"	WRONG WAY		25	
R10-6	24" x 36"	STOP HERE ON RED		20	
R11-2	48" x 30"	ROAD CLOSED		27	
R11-3a	60" x 30"	ROAD CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY		30	
R11-4	60" x 30"	ROAD CLOSED TO THRU TRAFFIC		30	
W1-1	48" x 48"	LEFT OR RIGHT TURN ARROW		34	
W1-2	48" x 48"	LEFT OR RIGHT CURVE ARROW		34	
W1-3	48" x 48"	REVERSE TURN SIGN (LEFT OR RIGHT)		34	
W1-4	48" x 48"	REVERSE CURVE SIGN (LEFT OR RIGHT)		34	
W3-1	48" x 48"	STOP AHEAD (SYMBOL)		34	
W3-2	48" x 48"	YIELD AHEAD (SYMBOL)		34	
W3-3	48" x 48"	SIGNAL AHEAD (SYMBOL)		34	
W3-4	48" x 48"	BE PREPARED TO STOP		34	
W3-5	48" x 48"	SPEED REDUCTION (45 MPH)	4	34	136
W4-1	48" x 48"	MERGE (SYMBOL)		34	
W4-2	48" x 48"	LEFT OR RIGHT LANE ENDS (SYMBOL)	4	34	136
W3-5	48" x 48"	SPEED REDUCTION (65 MPH)	4	34	136
W5-3	48" x 48"	ONE LANE BRIDGE		34	
W7-3aP	24" x 18"	NEXT __ MILES (PLAQUE)		15	
W8-1	36" x 36"	BUMP		27	
W8-6	48" x 48"	TRUCK CROSSING		34	
W8-7	36" x 36"	LOOSE GRAVEL		27	
W8-7	48" x 48"	LOOSE GRAVEL		34	
W8-9a	48" x 48"	SHOULDER DROP-OFF		34	
W8-11	48" x 48"	UNEVEN LANES		34	
W8-15	36" x 36"	GROOVED PAVEMENT		27	
W13-1P	24" x 24"	ADVISORY SPEED (PLAQUE)		16	
W13-1P	30" x 30"	ADVISORY SPEED (PLAQUE)		21	
W16-2P	30" x 24"	SUPPLEMENTAL DISTANCE (PLAQUE)		18	
W20-1	48" x 48"	ROAD WORK AHEAD	4	34	136
W20-2	48" x 48"	DETOUR AHEAD		34	
W20-3	48" x 48"	ROAD CLOSED AHEAD		34	
W20-4	48" x 48"	ONE LANE ROAD AHEAD		34	
W20-5	48" x 48"	LT. OR RT. LANE CLOSED AHEAD	4	34	136
W20-7	48" x 48"	FLAGGER (SYMBOL)	2	34	68
W21-1	48" x 48"	WORKERS (SYMBOL)		34	
W21-2	36" x 36"	FRESH OIL		27	
W21-3	48" x 48"	ROAD MACHINERY AHEAD		34	
W21-5	48" x 48"	SHOULDER WORK		34	
W21-5a	48" x 48"	RIGHT SHOULDER CLOSED	4	34	136
W21-5b	48" x 48"	RIGHT SHOULDER CLOSED AHEAD	4	34	136
*****	12" x 36"	TYPE III OBJECT MARKER		15	
*****	*****	TYPE 3 BARRICADE - 8 FT. SINGLE SIDED	2	40	80
*****	*****	TYPE 3 BARRICADE - 8 FT. DOUBLE SIDED		56	
				TOTAL UNITS	**1494**

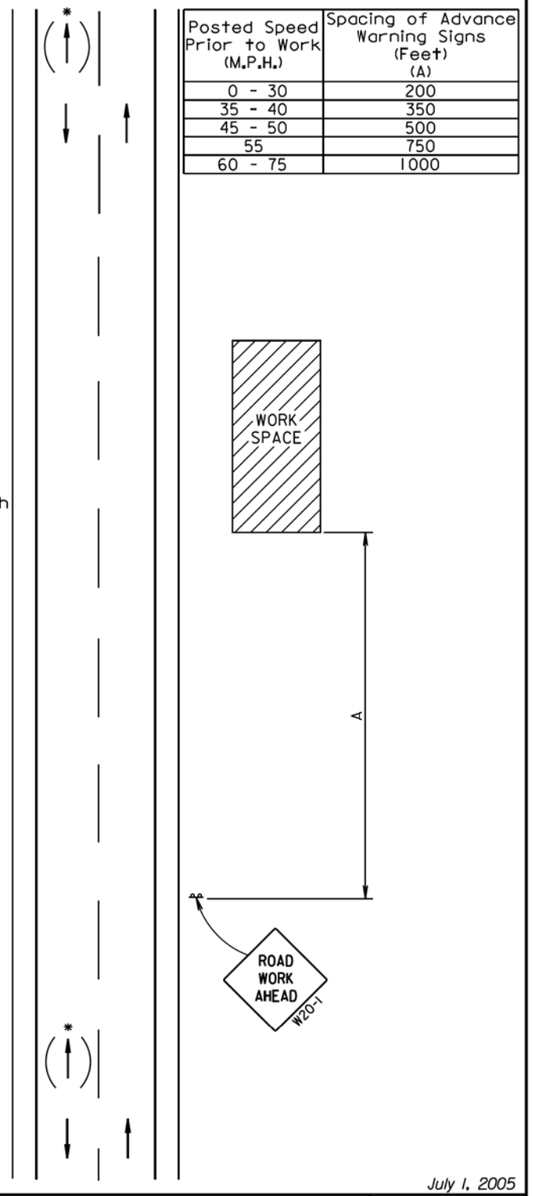
The signs illustrated are not required if the work space is behind a barrier, more than 2 feet behind the curb, or 15 feet or more from the edge of any roadway.

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

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

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

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



Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)
0 - 30	200
35 - 40	350
45 - 50	500
55	750
60 - 75	1000

July 1, 2005

Published Date: 2nd Qtr. 2014	SDDOT	GUIDES FOR TRAFFIC CONTROL DEVICES WORK BEYOND THE SHOULDER	PLATE NUMBER 634.01
			Sheet 1 of 1

◎ Reflectorized Drum

■ Channelizing Device shall be be 42" cones or drums

▭ Movable Concrete Barrier

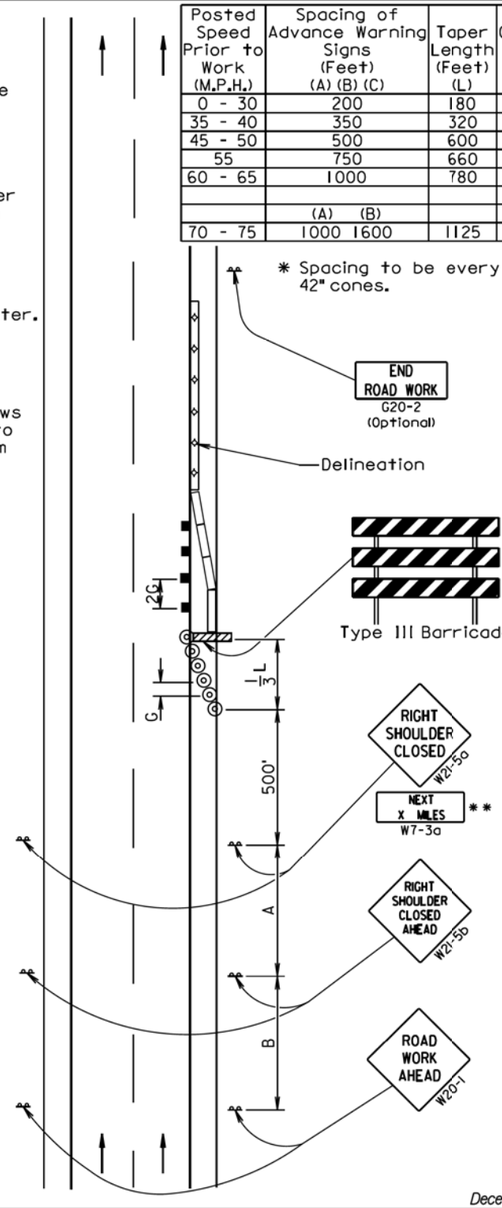
42" cones may be used in place of the drums shown in the taper if setup will not be used during any night time hours.

** For distances ½ mile or greater.

The barrier in this diagram shows one method that may be used to close a shoulder of a long term project. The use of a barrier should be based on the need determined by the Highway Authority.

The movable concrete barrier layout is shown elsewhere in the plans.

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A) (B) (C)	Taper Length (Feet) (L)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	200	180	25
35 - 40	350	320	25
45 - 50	500	600	50 *
55	750	660	50 *
60 - 65	1000	780	50 *
	(A) (B)		
70 - 75	1000 1600	1125	50 *



December 23, 2012

Published Date: 2nd Qtr. 2014	SDDOT	GUIDES FOR TRAFFIC CONTROL DEVICES SHOULDER CLOSED	PLATE NUMBER 634.61 Sheet 1 of 1

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet) (G)	Taper Length (Feet) (L)	Spacing of Advanced Warning Signs (Feet) (ABC)
0 - 30	25	180	200
35 - 40	25	320	350
45 - 50	50 *	600	500
55	50 *	660	750
60 - 65	50 *	780	1000
70 - 75	50 *	900	1000 1500 2640

* Spacing to be every 40' for 42" cones.

4" white temporary pavement marking tape for right lane closures and 4" yellow temporary pavement marking tape for left lane closures or temporary road markers at 5' spacing shall be installed when the lane is closed overnight or longer.

Signs a, b, and c shall be removed or covered when workers are not present.

ROAD WORK AHEAD sign is only required in advance of the first lane closure.

The FLAGGER sign shall be used whenever there is a Flagger present.

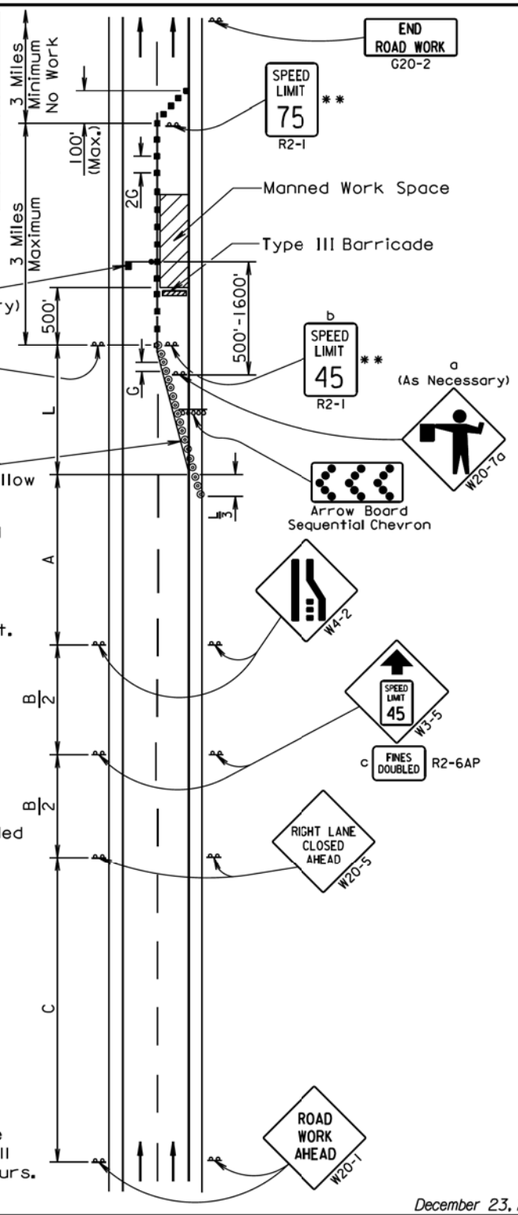
Left mounted advance signs on undivided highways are not required.

** Speed appropriate for location.

◎ Reflectorized Drum

■ Channelizing Device shall be 42" cones or drums

42" cones may be used in place of the drums shown in the taper if setup will not be used during any night time hours.



December 23, 2012

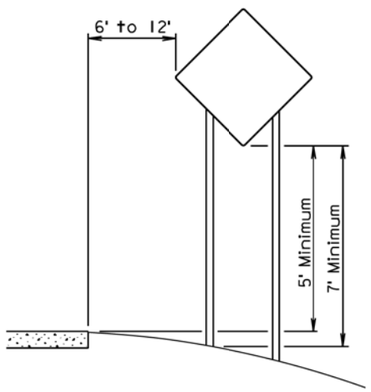
Published Date: 2nd Qtr. 2014	SDDOT	MANNED WORK SPACE SIGNING FOR DIVIDED AND UNDIVIDED HIGHWAYS	PLATE NUMBER 634.63 Sheet 1 of 1

PLOT SCALE - 1:206.452

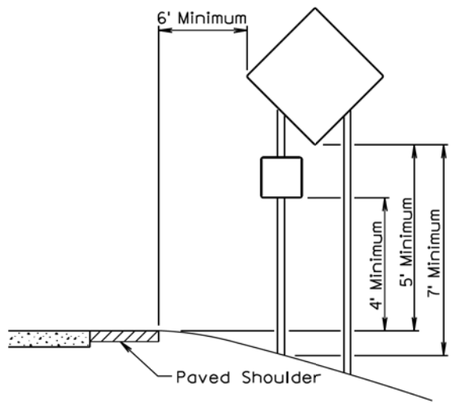
PLOTTED FROM - TRM11NT17

PLOT NAME - 2

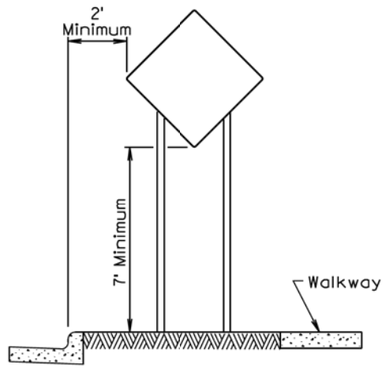
FILE - ...\LYMN041D\041D TC CONTAINER.DGN



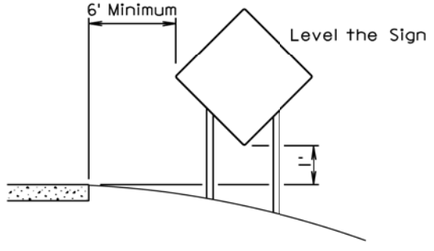
RURAL DISTRICT



RURAL DISTRICT WITH SUPPLEMENTAL PLATE



URBAN DISTRICT



RURAL DISTRICT
3 DAY MAXIMUM

February 14, 2011

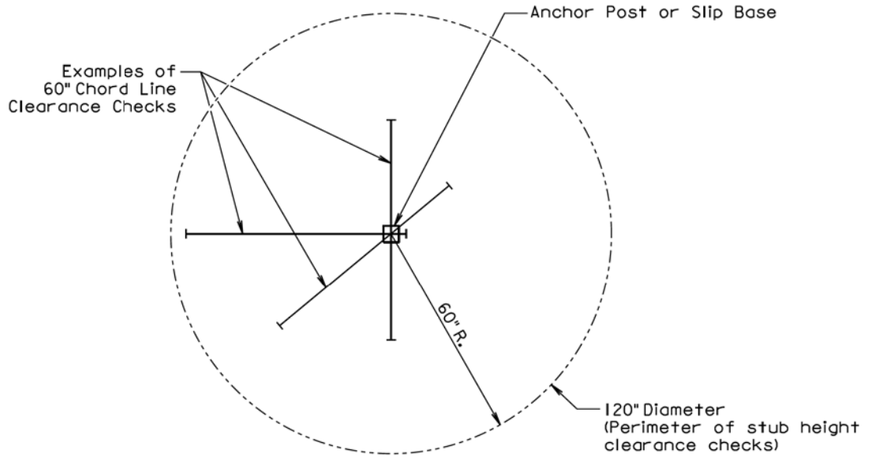
Published Date: 2nd Qtr. 2014

SDDOT

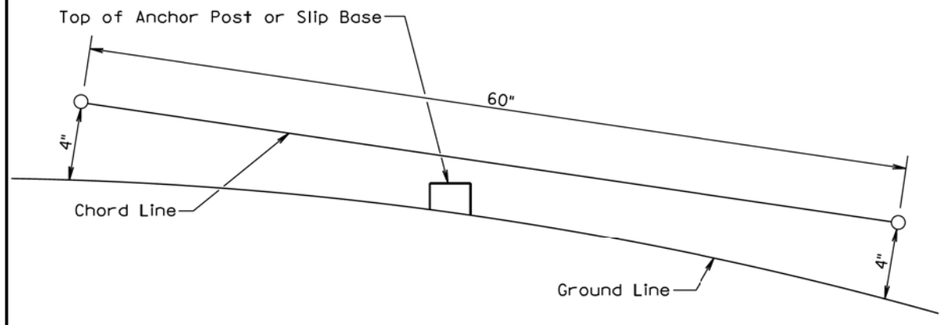
CRASHWORTHY SIGN SUPPORTS
(Typical Construction Signing)

PLATE NUMBER 634.85

Sheet 1 of 1



PLAN VIEW
(Examples of stub height clearance checks)



ELEVATION VIEW

GENERAL NOTES:

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

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

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

July 1, 2005

Published Date: 2nd Qtr. 2014

SDDOT

BREAKAWAY SUPPORT STUB CLEARANCE

PLATE NUMBER 634.99

Sheet 1 of 1

CONTROL DATA

HORIZONTAL AND VERTICAL CONTROL POINTS

POINT	DESCRIPTION	NORTHING	EASTING	ELEVATION
CP1	BRASS DISK IN TOP OF NE WINGWALL OF STRUCTURE ON WESTBOUND LANES OF I-90 @ MRM 259.60	538114.9939	2211994.0295	1399.6573
CP2	DURANAIL & WASHER STAMPED "SDDOT CONTROL PT" IN TOP OF NW WINGWALL OF RAILROAD STRUCTURE ON WESTBOUND LANES OF I-90 - MRM 259.84	537409.8325	2213084.7734	1424.7496
CP3	DURANAIL & WASHER STAMPED "SDDOT CONTROL PT" IN TOP OF SW WINGWALL OF RAILROAD STRUCTURE ON EAST BOUND LANES OF I-90 - MRM 259.86	537240.9883	2213091.4845	1427.1483
CP4	NGS POINT NE OF WESTBOUND RAILROAD STRUCTURE APPROX 90' NORTH OF CENTERLINE OF WB LANES - MRM 259.87	537357.0733	2213273.8787	1427.3694
CP5	BRASS DISK - TOP OF SE WINGWALL OF RAILROAD STRUCURE ON EASTBOUND LANES OF I-90 - MRM 259.90	537138.2121	2213251.2403	1431.4241
CP6	5/8" X 5' REBAR & CAP STAMPED "SDDOT CONTROL POINT" ALONG ROW FENCE 220'+/- SOUTH OF CL OF EBLS - MRM 259.98	536771.7655	2213474.8697	1441.5780
I90 260.4	NGS POINT ALONG ROW FENCE OF WB ON-RAMP - MRM 260.40	536696.3678	2215551.0327	1432.5160
I90 263.40	NGS POINT ALONG EB OFF-RAMP ROW FENCE - MRM 263.40	534227.4017	2229046.7471	1438.6417
CP8	DURANAIL & WASHER STAMPED "SDDOT CONTROL PT" IN TOP OF SW WINGWALL OF OVERPASS BRIDGE - MRM 263.49	534339.7611	2229773.3806	1449.4319
CP9	BRASS DISK IN TOP OF SE WINGWALL OF OVERPASS BRIDGE - MRM 263.53	534185.2226	2229948.8340	1459.9595
CP10	DURANAIL & WASHER STAMPED "SDDOT CONTROL PT" IN TOP OF NE WINGWALL OF OVERPASS BRIDGE - MRM 263.53	534250.5413	2230006.5253	1459.9337
CP11	BRASS DISK - TOP OF SE WINGWALL OF WESTBOUND OFF-RAMP BRIDGE - MRM 263.53	534415.7815	2230168.6443	1462.1861
CP12	DURANAIL & WASHER STAMPED "SDDOT CONTROL PT" IN TOP OF NW WINGWALL OF OVERPASS BRIDGE - MRM 263.49	534405.2084	2229831.1214	1449.4307
CP13	BRASS DISK - TOP NE WINGWALL OF MISSOURI RIVER BRIDGE ON I-90 (CP10 FROM BRULE 01QR PROJ) - MRM 263.29	535074.1570	2229071.4995	1419.2609

The coordinates shown on this sheet are based on the South Dakota State Plane Coordinate System.
South Zone (NAD 83/96) SF = 0.99984760
The elevations shown on this sheet are based on NAVD 88.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0905(107)259	13	72

HORIZONTAL ALIGNMENT DATA

I90 AT OACOMA

Type	Station			Northing	Easting
POB	31+83.00			537535.938	2212754.625
		TL= 866.79	S 57°48'53" E		
PC	40+49.79			537074.234	2213488.215
PI	48+59.37	R = 3819.72	Delta = 23°56'00" L	536643.004	2214173.387
PT	56+45.34			536526.806	2214974.585
		TL= 331.05	S 81°44'53" E		
POE	59+76.39			536479.291	2215302.207

I90 AT CHAMBERLAIN

Type	Station			Northing	Easting
POB	58+29.32			534864.218	2229247.414
		TL= 1178.73	S 48°37'45" E		
PC	70+08.05			534085.160	2230131.988
PI	81+67.67	R = 5729.58	Delta = 22°53'00" R	533318.731	2231002.222
PT	92+96.38			532274.226	2231505.938
		TL= 203.62	S 25°44'45" E		
POE	95+00.00			532090.819	2231594.386

RR ALIGNMENT

Type	Station			Northing	Easting
POB	0+00.00			537022.132	2213187.346
		TL= 509.95	N 5°05'01" W		
POE	5+09.95			537530.074	2213142.160

ALIGNMENT UNDER STR. NO. 08-065-095

Type	Station			Northing	Easting
POB	0+00.00			534140.579	2229775.965
		TL= 382.60	N 41°24'26" E		
POE	3+82.60			534427.540	2230029.019

DITCH ALIGNMENT

Type	Station			Northing	Easting
POB	0+00.00			536873.080	2213341.494
		TL= 151.96	N 77°04'23" E		
PC	1+51.96			536907.075	2213489.601
PI	1+93.58	R = 100.00	Delta = 45°12'01" R	536916.387	2213530.172
PT	2+30.85			536894.160	2213565.367
		TL= 56.82	S 57°43'36" E		
POE	2+87.66			536863.823	2213613.406

The coordinates shown on this sheet are based on the South Dakota State Plane Coordinate System. South Zone (NAD 83/96) SF = 0.99984760

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0905(107)259	14	72

Plotting Date: 03/19/2014

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
- Deck Edge
- Ditch Block
- Doorway Threshold
- Drainage Profile
- Drop Inlet
- Edge Of Asphalt
- Edge Of Concrete
- Edge Of Gravel
- Edge Of Other
- Edge Of Shoulder
- Elec. Trans./Power Jct. Box
- Fence Barbwire
- Fence Chainlink
- Fence Electric
- Fence Misc.
- Fence Rock
- Fence Snow
- Fence Wood
- Fence Woven
- Fire Hydrant
- Flag Pole
- Flower Bed
- Gas Valve Or Meter
- Gas Pump Island
- Grain Bin
- Guardrail
- Guide Sign One Post
- Guide Sign Two Post
- Gutter
- Guy Pole
- Haystack
- Hedge
- Highway R.O.W. Marker
- Interstate Close Gate
- Iron Pin
- Irrigation Ditch
- Lake Edge
- Lawn Sprinkler
- Mailbox
- Manhole Electric
- Manhole Gas
- Manhole Misc
- Manhole Sanitary Sewer
- Manhole Storm Sewer
- Manhole Telephone
- Manhole Water
- Merry-Go-Round
- Microwave Radio Tower
- Misc. Line
- Misc. Property Corner
- Misc. Post
- Overhang Or Encroachment
- Overhead Utility Line — OH —
- Parking Meter
- Pipe With End Section
- Pipe With Headwall
- Pipe Without End Section
- Playground Slide
- Playground Swing
- Power And Light Pole
- Power And Telephone Pole
- Power Meter
- Power Pole
- Power Pole And Transformer
- Power Tower Structure
- Propane Tank
- Property Pipe
- Property Pipe With Cap
- Property Stone
- Public Telephone
- Railroad Crossing Signal
- Railroad Milepost Marker
- Railroad Profile
- Railroad R.O.W. Marker
- Railroad Signs
- Railroad Switch
- Railroad Track
- Railroad Trestle
- Rebar
- Rebar With Cap
- Reference Mark
- Regulatory Sign One Post
- Regulatory Sign Two Post
- Retaining Wall
- Riprap
- River Edge
- Rock And Wire Baskets
- Rockpiles
- Satellite Dish
- Septic Tank
- Shrub Tree
- Sidewalk
- Sign Face
- Sign Post
- Slough Or Marsh
- Spring
- Stream Gauge
- Street Marker
- Subsurface Utility Exploration Test Hole
- Telephone Fiber Optics — T/F —
- Telephone Junction Box
- Telephone Pole
- Television Cable Jct Box
- Television Tower
- Test Wells/Bore Holes
- Traffic Signal
- Trash Barrel
- Tree Belt
- Tree Coniferous
- Tree Deciduous
- Tree Stumps
- Triangulation Station
- Underground Electric Line — P —
- Underground Gas Line — G —
- Underground High Pressure Gas Line — HG —
- Underground Sanitary Sewer — S —
- Underground Storm Sewer — S —
- Underground Tank
- Underground Telephone Line — T —
- Underground Television Cable — TV —
- Underground Water Line — W —
- Warning Sign One Post
- Warning Sign Two Post
- Water Fountain
- Water Hydrant
- Water Meter
- Water Tower
- Water Valve
- Water Well
- Weir Rock
- Windmill
- Wingwall
- Witness Corner

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

Plot Scale - 1:200

Plotted From - tmp14419

File - ...\SeedEnglish\toposymb.dgn

STR. NO. 43-479-271

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0905(107)259	15	72

Plotting Date: 06/13/2014

Sec. 14 - T104N - R72W

Sec. 24 - T104N - R72W

Sec. 23 - T104N - R72W

Section Line

Section Line

RR Alignment

℄ WBL

I90

℄ EBL

35+00

40+00

5+00

0+00

2+88

0+00

35+41.345 Begin Str. No. 43-479-271

38+03.155 End Str. No. 43-479-271

I90 at Oacoma

Do not disturb Pier Wall & Spread Footing

Do not disturb Drain Outlet

2 PP

38+17 R
Begin Type 2
Fence

39+65 R
End Type 2
Fence

3 PP

340'

197.49'

66'

66'

30" RCP with
Headwall
In Place

30" RCP with Headwalls
In Place

Ditch Cleanout from
Embankment Reconstruction
to In Place 30" Pipe

Ditch Alignment

38+04 - 147' Rt (I90 at Oacoma)
Remove Type M Median Drain

38+31 (I90 at Oacoma)
24" RCP with Flared End,
RCP to CMP Transition and CMP
Downspout In Place
Remove Downspout (62')
Remove Elbow
Install 24" CMP x 78', 2 24" CMP Elbows
& 1 Flared End (20° Elbow to 60' Pipe to
20° Elbow to 18' Pipe to Flared End)

38+31 - 173' Rt (I90 at Oacoma)
Place Class B Riprap
9'x9'x2' (8.4 Tons)
and Type B Drainage Fabric
(19 SqYd)

38+05 Rt to 42+03 Rt (I90 at Oacoma)
24" CMP with Flared End In Place
Remove 200' Pipe (From East Side),
Remove 2 Elbows & 1 Flared End.
Fill the Remaining in place pipe with
Controlled Density Fill (22.8 CuYds)

0+00 Rt to 1+80 Rt (RR Alignment)
Excavate unstable landside debris
& reconstruct Berm Slope

0+45 - 21' Rt to 1+45 -21' Rt (RR Alignment)
Install Gravity Large Concrete Block Retaining
Wall (refer to detail sheets for 100'-0" Gravity
Large Concrete Block Retaining Wall)

0+45 - 20' Rt to 1+45 -20' Rt (RR Alignment)
Install Underdrain with 4" Slotted Polyethylene
Drainage Tubing

0+58 (RR Alignment)
Install 4" Solid Polyethylene Drainage
Tubing in existing 30" RCP with Headwall.
Tee into 4" Slotted Polyethylene Drainage
Tubing for Underdrain. Fill 30" RC host pipe
with Cellular Grout (8.9 CyYds)

0+75 - 68.57' Rt to 1+10 - 73.44' Rt (RR Alignment)
Install 4" Solid Polyethylene drainage tubing
(at 0+75 install Precast Concrete Headwall for Drain)
(at 1+10 Tee drainage tubing into 36" Strip Drain)

1+10 - 73.44' Rt to 1+60 - 80' Rt (RR Alignment)
Install 36" Strip Drain against & below Backwall

0+70 to 2+38 (Ditch Alignment)
Construct Ditch Diversion

PLOT SCALE - 1:60

PLOT NAME - 2

PLOTTED FROM - TRM111118

FILE - ...\PRJ2014\LYMN041TD\D041TD.DGN

STR. NO. 43-479-271

FINISHED CONTOUR MAP

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0905(107)259	16	72

Plotting Date: 06/16/2014

℄ WBL

I90

℄ EBL

38+00

37+00

2+00

1+00

0+00

1430 1425 1420 1415 1410 1405 1400 1395 1390 1385

3:1

2:1

*Adjacent to the Interstate the slope shall be a 4:1 or flatter.

**The slope shall be a 2:1 or flatter.

PLOT SCALE - 1:20

PLOT NAME - 3

FILE - ...\PRJ2014\LYMN04TD\C04TD0.DGN

PLOTTED FROM - TRM111118

STR. NO. 08-065-095

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0905(107)259	17	72

Plotting Date: 06/13/2014

PLOT SCALE - 1:60

PLOT NAME - 4

FILE - ...\PRJ2014\LYMN04TD\D041TD.DGN

PLOTTED FROM - TRM111118

1/4 Line

1/4 Line

Exit 263 WB On Ramp

Exit 263 WB Off Ramp

Exit 263 EB On Ramp

℄ WBL

I90

℄ EBL

65+69.80 Begin Str. No. 08-065-095

68+05.80 End Str. No. 08-065-095

65+00

70+00

3+83

0+00

P

HO

S Main St

1+40 Rt to 2+30 Rt
Excavate unstable landside debris
& reconstruct Berm Slope

1+50 - 99.49' Rt to 2+30 - 99.30' Rt
Install 36" Strip Drain against & below Backwall

1+94 - 99.4' Rt (Abutment Backwall)
Tee existing 4" Solid Polyethylene drainage
tubing into 36" Strip Drain

Do not disturb Pier Wall & Spread Footing

1+30 - 83.30' Rt to 1+50 - 99.49' Rt
Install 4" Solid Polyethylene drainage tubing
(at 1+30 install Precast Concrete Headwall for Drain)
(at 1+50 Tee drainage tubing into 3' Strip Drain)

Sec. 21 - T104N - R71W

STR. NO. 08-065-095

FINISHED CONTOUR MAP

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0905(107)259	18	72

Plotting Date: 06/16/2014

1/4 Line

S Main St

1425

1+00

2+00

3+00

67+00

68+00

1425
1430
1435
1440
1445
1450
1455
1460

2:1

2:1

℄ EBL

190

℄ WBL

PLOT SCALE - 1:20

PLOT NAME - 5

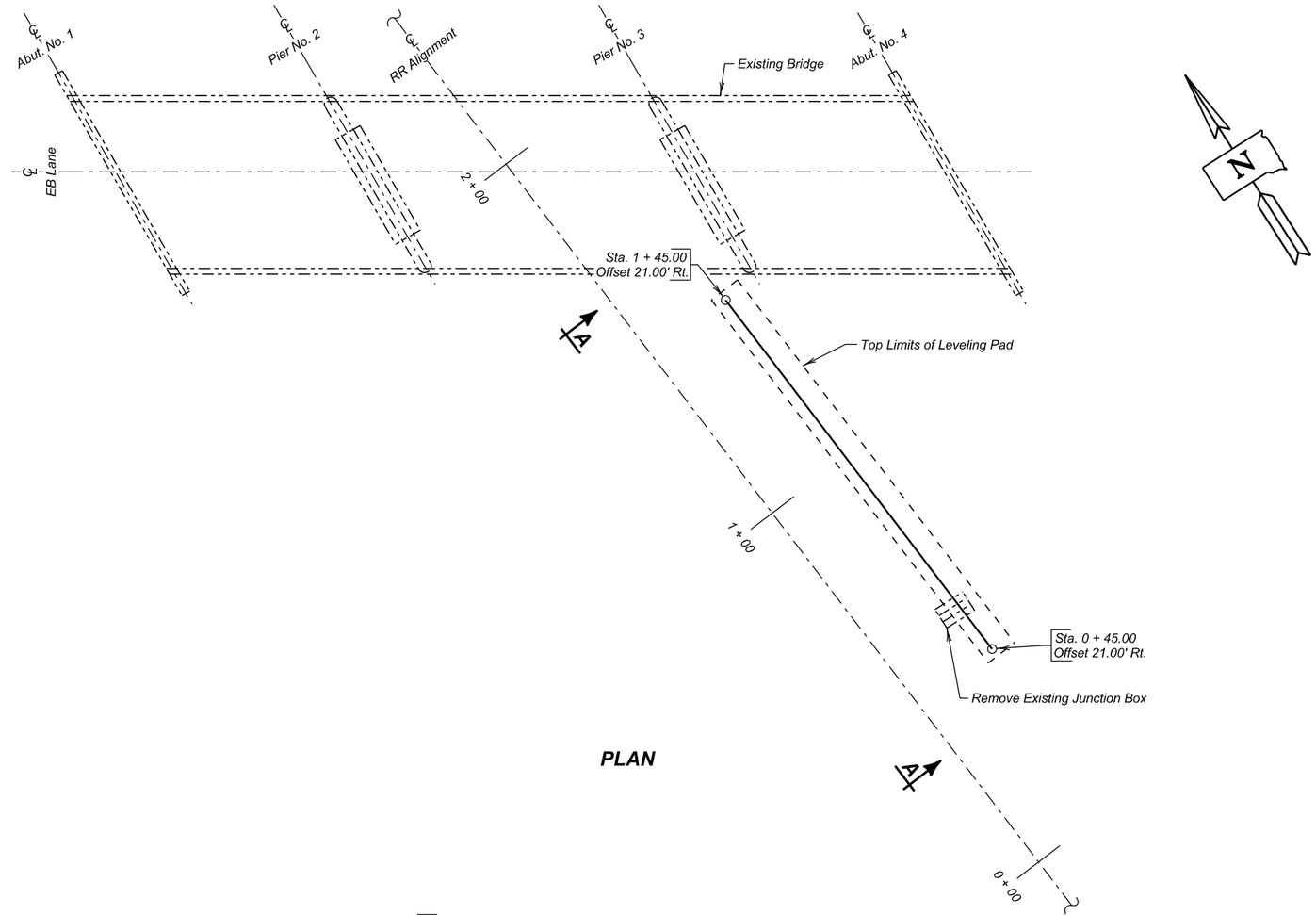
FILE - ...\PROJ2014\LYMN04TD\C04TDC.DGN

PLOTTED FROM - TRMI111118

The elevations shown in these plans are based on the National Geodetic Survey (NGS) North American Vertical Datum of 1988 (NAVD88).

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0905(107)259	19	72

INDEX OF RETAINING WALL SHEETS-



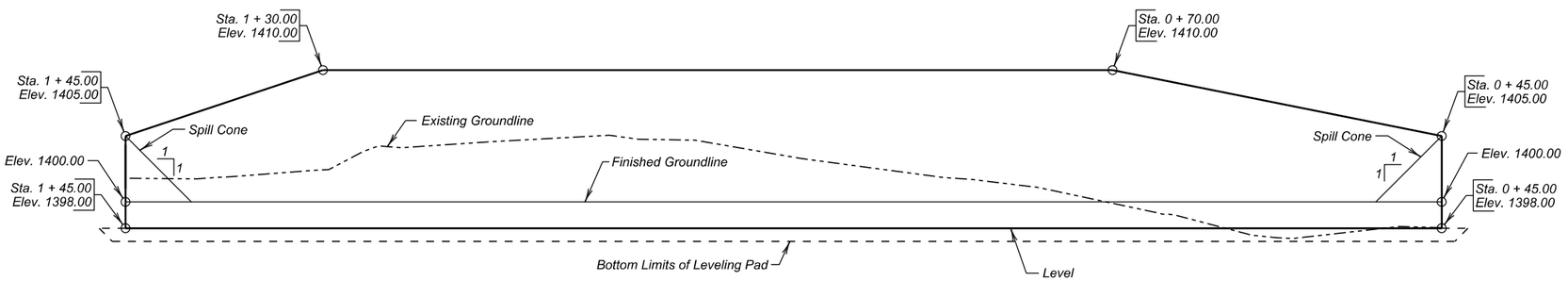
PLAN

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY
Gravity Large Concrete Block Retaining Wall	Sq. Ft.	1100
Granular Backfill for Gravity Large Concrete Block Wall	Cu. Yd.	272.2
⊛ ⌀ Base Course	Ton	58

⌀ For estimating purposes only, a factor of 1.89 tons/cu. yd. was used to convert cu. yds. to tons.

⊛ Base on 60" wide base block.



VIEW A - A

GENERAL DRAWING AND QUANTITIES

FOR

100' - 0" GRAVITY LARGE CONCRETE BLOCK RETAINING WALL

STA. 0 + 45.00 TO 1 + 45.00 (RR ALIGNMENT)
PCN 04TD

SEC. 14/23-T104N-R72W
IM 0905(107)259

LYMAN COUNTY

S. D. DEPT. OF TRANSPORTATION

APRIL 2014

1 OF 2

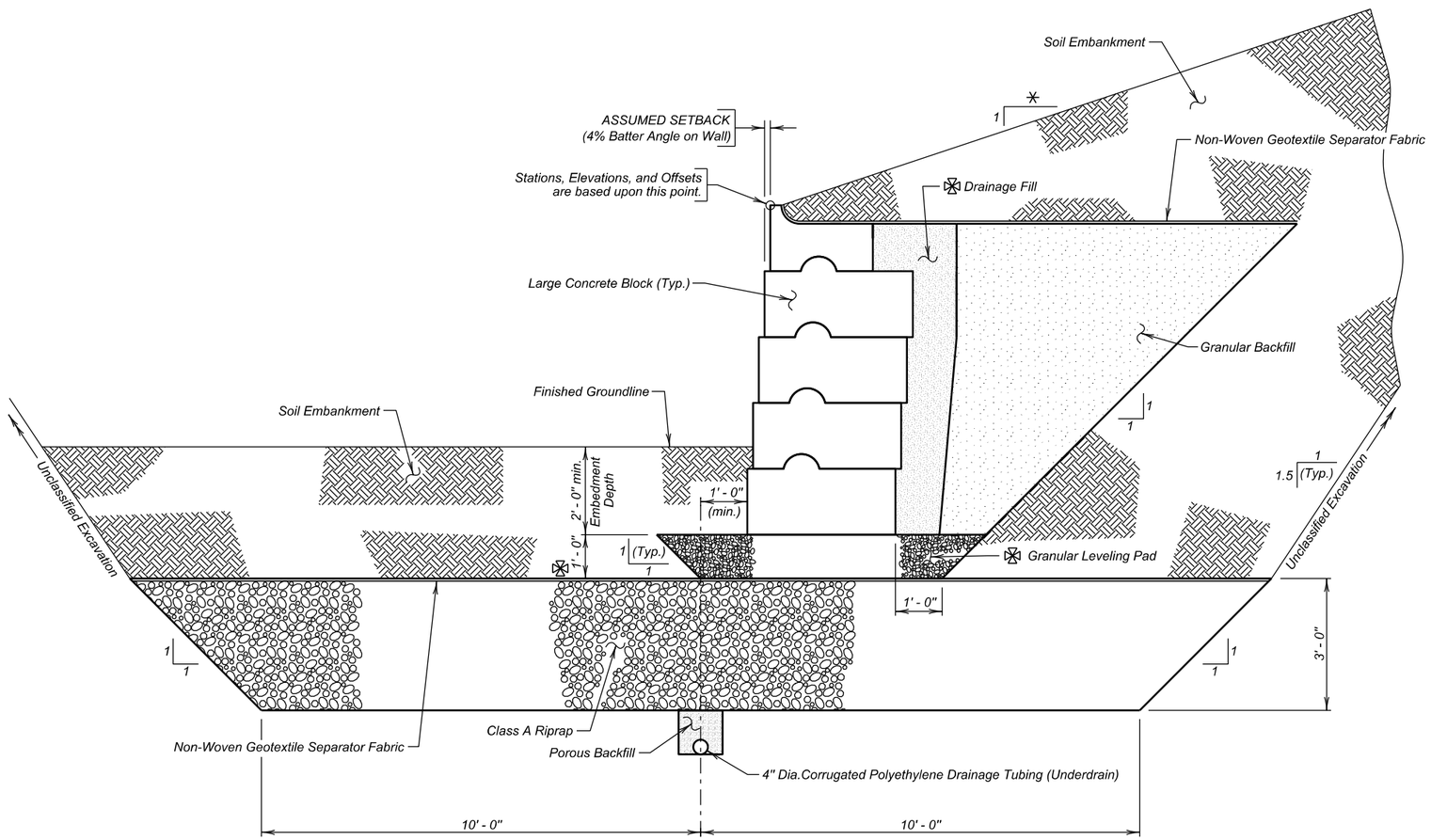
PLANS BY :
OFFICE OF BRIDGE DESIGN, SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION

DESIGNED BY	CK. DES. BY	DRAFTED BY	
MM	SK	MG	Kevin N. Goeden
LYMN04TD	04TDGA01		BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0905(107)259	20	72

✠ As per Manufacturer's Recommendations.

✳ See Cross Sections for Finished Slope.



TYPICAL SECTION

SPECIFICATIONS

1. *Design Specifications: AASHTO LRFD Bridge Design Specifications, 2012 Edition with 2013 interims.*
2. *Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, 2004 Edition and Required Provisions, Supplemental Specifications and Special Provisions as included in the Proposal.*

RETAINING WALL

1. *The Gravity Large Concrete Block Retaining Wall shall be on the current approved products list located at the following website address: http://apps.sd.gov/HC60ApprovedProducts/main.aspx.*
2. *The Contractor shall consult with an approved wall company and obtain design calculations and construction plans done by a South Dakota Registered Professional Engineer. 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 detailed listing of all quantities required for wall construction including concrete retaining wall blocks, excavation, granular backfill, and foundation preparation.*
3. *See Grading Plans for the excavation and placement of the underdrain, riprap, non-woven geotextile separator fabric, porous backfill, and unclassified excavation.*
4. *Place the gravity large block retaining wall system on a granular leveling pad directly on the geotextile fabric. The limits of the leveling pad shall extend a minimum of 1.0 ft in all directions from all sides of the base blocks. The remainder of the fabric shall be covered with soil backfill. Material for the leveling pad shall conform to the specifications for aggregate base course in Section 882 of the Specifications. Compaction shall be governed by the Specified Density Method. All costs for equipment, labor, tools, and incidentals required for the furnishing, placing, watering, and compacting the aggregate base course used in the leveling pad shall be paid for at the contract unit price per ton for Base Course.*
5. *The minimum embedment depth to the bottom of the wall for gravity large concrete block retaining wall shall be 2.0 ft.*
6. *Construction of the wall shall begin at the lowest course and proceed upwards. The lowest course must be placed and backfilled in its entirety prior to construction of any subsequent courses. Backfill placement must be placed in successive horizontal lifts.*
7. *Drainage fill material for the gravity large concrete block retaining wall system shall meet the criteria as set by the wall block manufacturer and shall be incidental to the bid item "Gravity Large Concrete Block Retaining Wall".*
8. *Remaining backfill behind wall shall conform to the requirements of granular bridge end backfill in Section 882 of the Specifications. Compaction shall be governed by the Specified Density Method. All costs for equipment, labor, tools, and incidentals required for the furnishing, placing, watering, and compacting of the granular backfill shall be paid for at the contract unit price per ton for Granular Backfill for Gravity Large Concrete Block Wall.*
9. *The retaining wall shall be installed in accordance with the selected wall companies' instructions, specifications, and approved shop drawings.*
10. *Quantities for Gravity Large Concrete Block Wall, Granular Backfill for Gravity Large Concrete Block Wall, and Base Course are for bidding purposes only. Actual quantities for the 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. The various bid items will be full compensation for the construction of the gravity large concrete block wall.*

TYPICAL SECTION & NOTES

FOR

100' - 0" GRAVITY LARGE CONCRETE BLOCK RETAINING WALL

STA. 0 + 45.00 TO 1 + 45.00 (RR ALIGNMENT)

SEC. 14/23-T104N-R72W

IM 0905(107)259

LYMAN COUNTY

S. D. DEPT. OF TRANSPORTATION

APRIL 2014

2 OF 2

DESIGNED BY	CK. DES. BY	DRAFTED BY	
MM	SK	MG	Kevin N. Goeden
LYMN04TD	04TDGA02		BRIDGE ENGINEER

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0905(107)259	21	72

Plotting Date: 06/13/2014

STR. NO. 43-479-271

EROSION CONTROL

Install 12" Erosion Control Wattle (60')

Install 12" Erosion Control Wattle (30')

Install 12" Erosion Control Wattle (100')

Install 12" Erosion Control Wattle (80')

Install 12" Erosion Control Wattle (55')

Install 12" Erosion Control Wattle (140')

Install 12" Erosion Control Wattle (65')

Install 12" Erosion Control Wattle (20')

Install 12" Erosion Control Wattle (15')

Install 12" Erosion Control Wattle (20')

Install 12" Erosion Control Wattle (20')

2+00

1+00

0+00

38+00

39+00

40+00

41+00

42+00

0+00

1+00

2+00

℄ WBL

℄ EBL

Section Line

190

P

HO

R

Sec. 23 - T104N - R72W

PLOT SCALE - 1:40

PLOT NAME - 6

FILE - ...\04TD_EROSIONCONTROL.DGN

PLOTTED FROM - TRM111118

STR. NO. 08-065-095

EROSION CONTROL

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0905(107)259	22	72

Plotting Date: 06/13/2014

PLOT SCALE - 1:40

PLOT NAME - 7

FILE - ...\04TD_EROSIONCONTROL.DGN

PLOTTED FROM - TRM111118

65+00

66+00

67+00

68+00

69+00

70+00

0+00

1+00

2+00

3+00

P

HO

HO

1/4 Line

S Main St

Exit 263 WB Off Ramp

Install 12" Erosion Control Wattle (95')

Install 12" Erosion Control Wattle (95')

Install 12" Erosion Control Wattle (95')

℄ WBL

I90

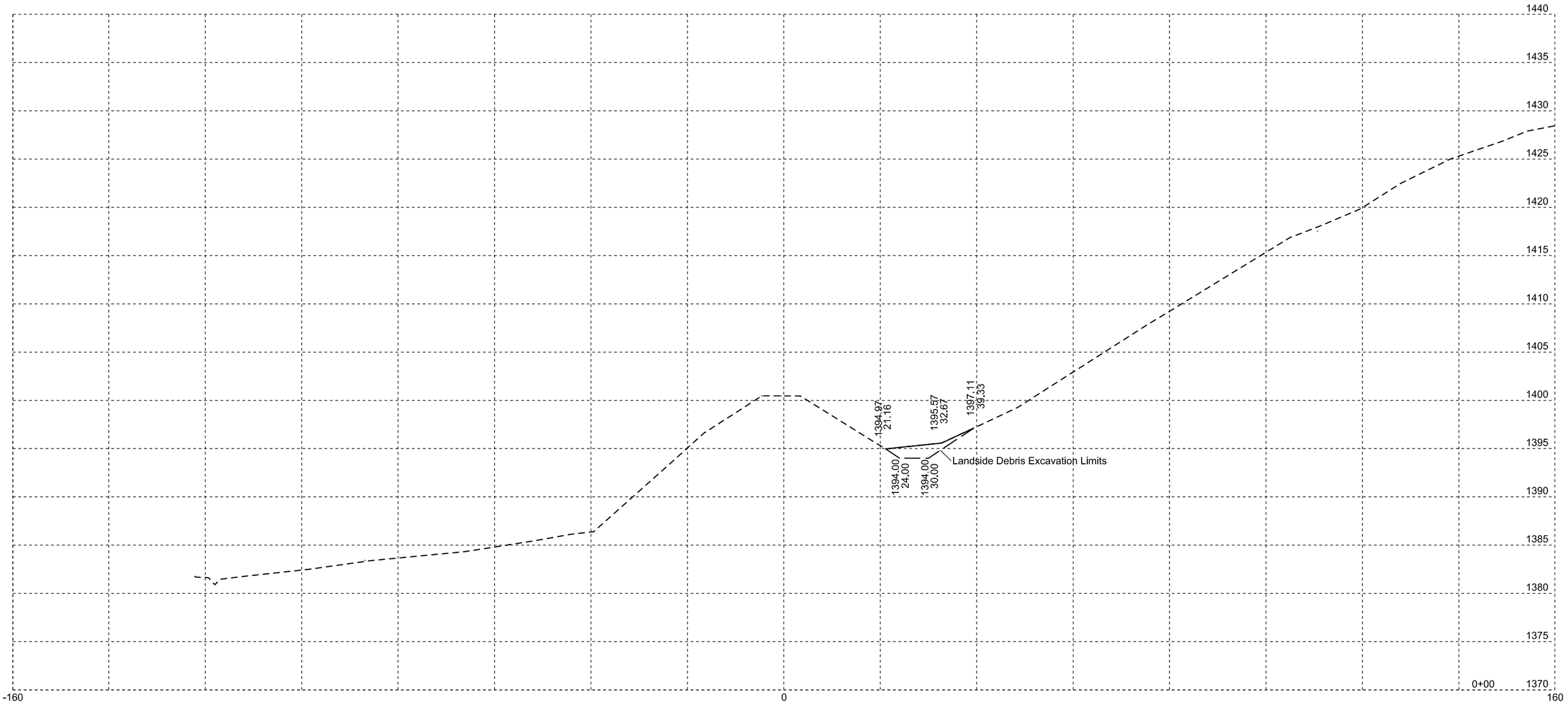
℄ EBL

Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	23	72

STR. NO. 43-479-271

(RR ALIGNMENT)

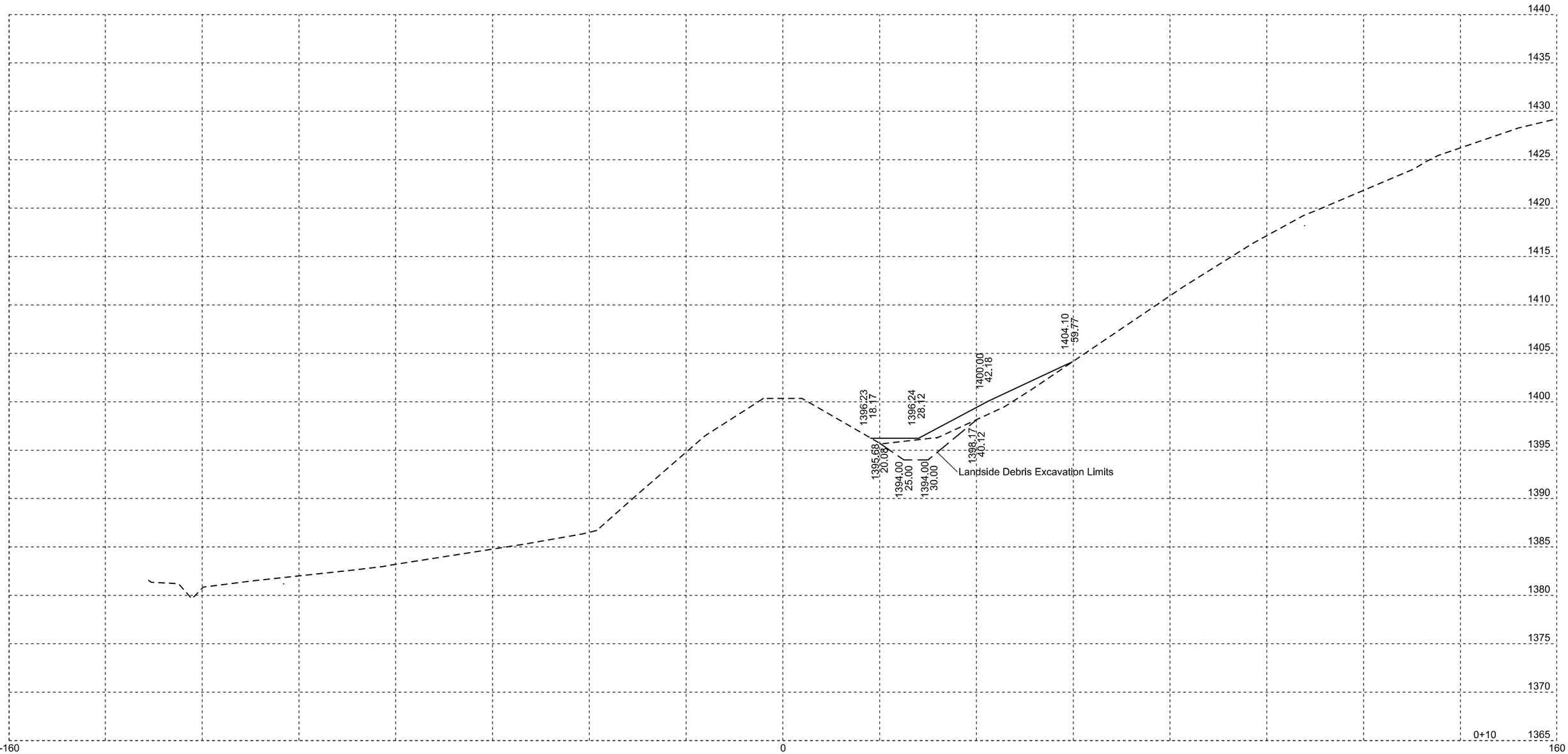


Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	24	72

STR. NO. 43-479-271

(RR ALIGNMENT)

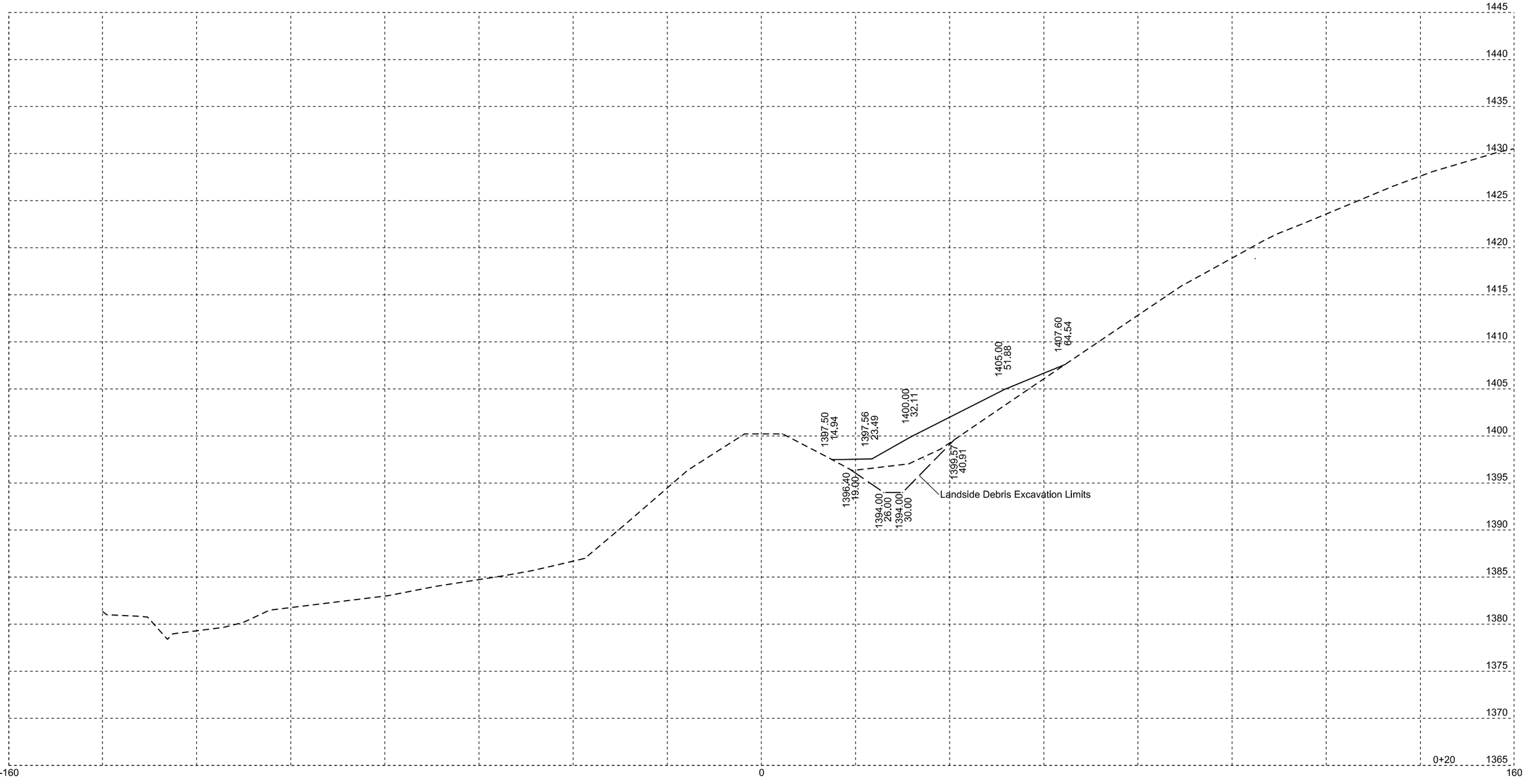


Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	25	72

STR. NO. 43-479-271

(RR ALIGNMENT)

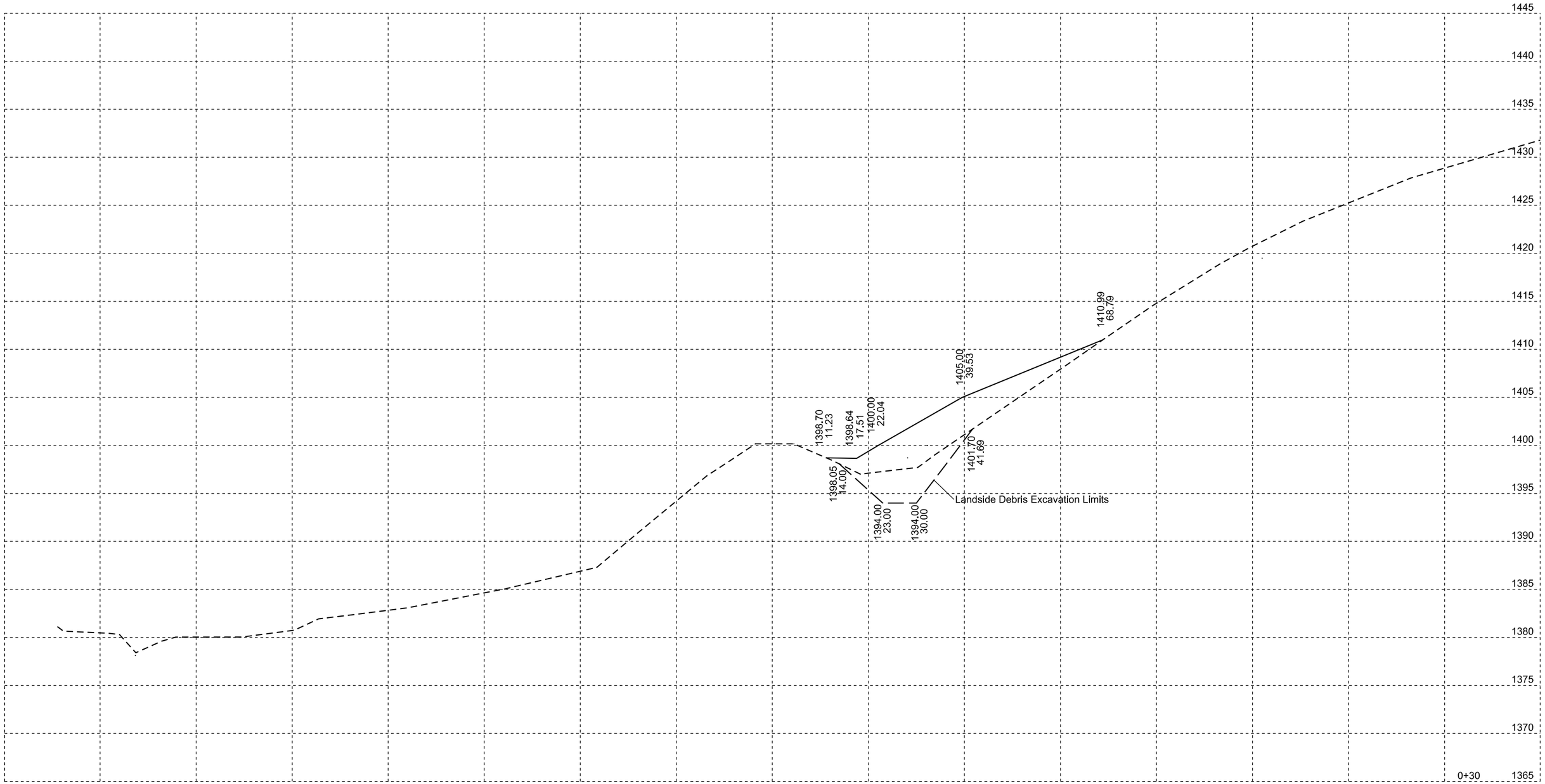


Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	26	72

STR. NO. 43-479-271

(RR ALIGNMENT)

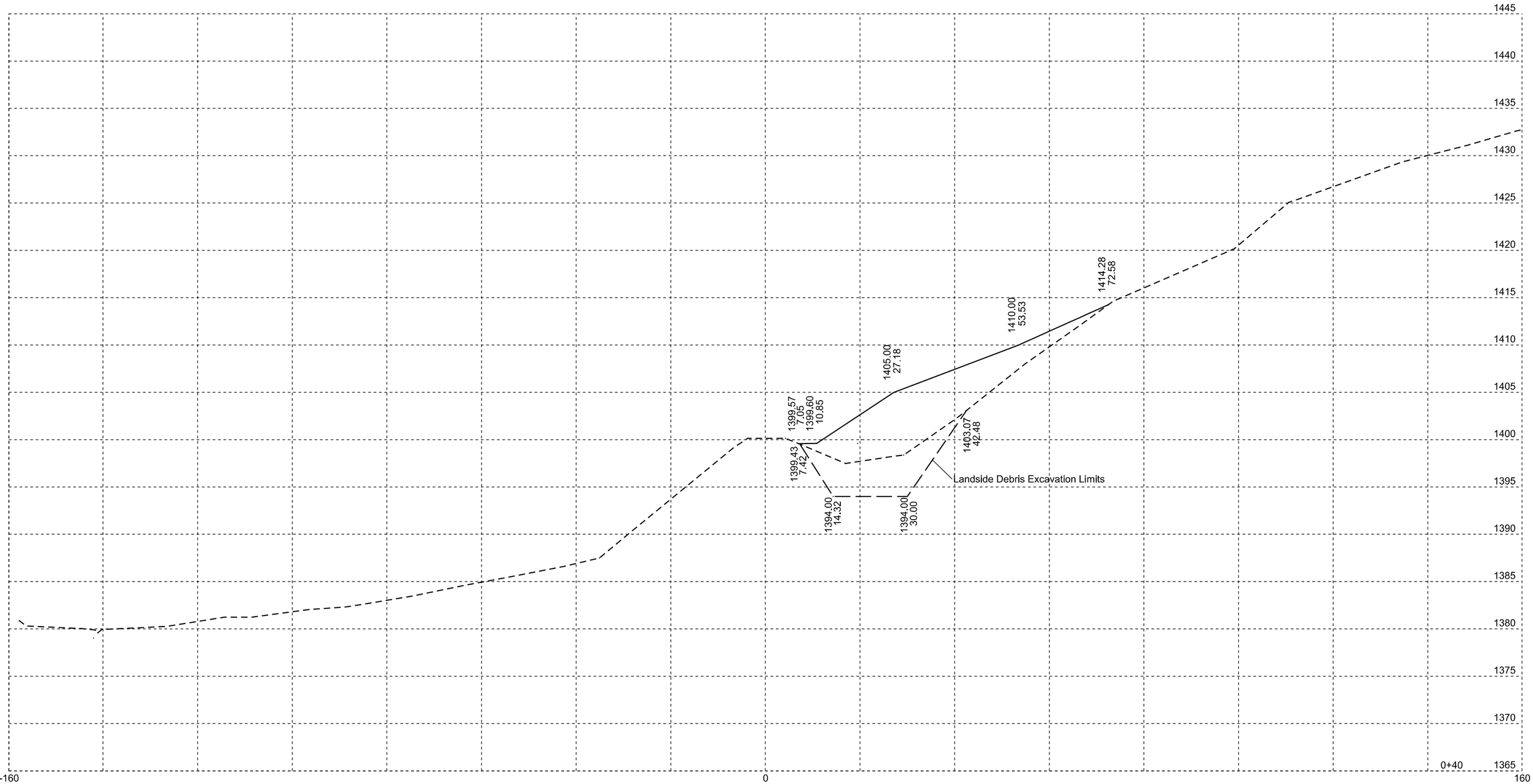


Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	27	72

STR. NO. 43-479-271

(RR ALIGNMENT)



Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	28	72

STR. NO. 43-479-271

(RR ALIGNMENT)

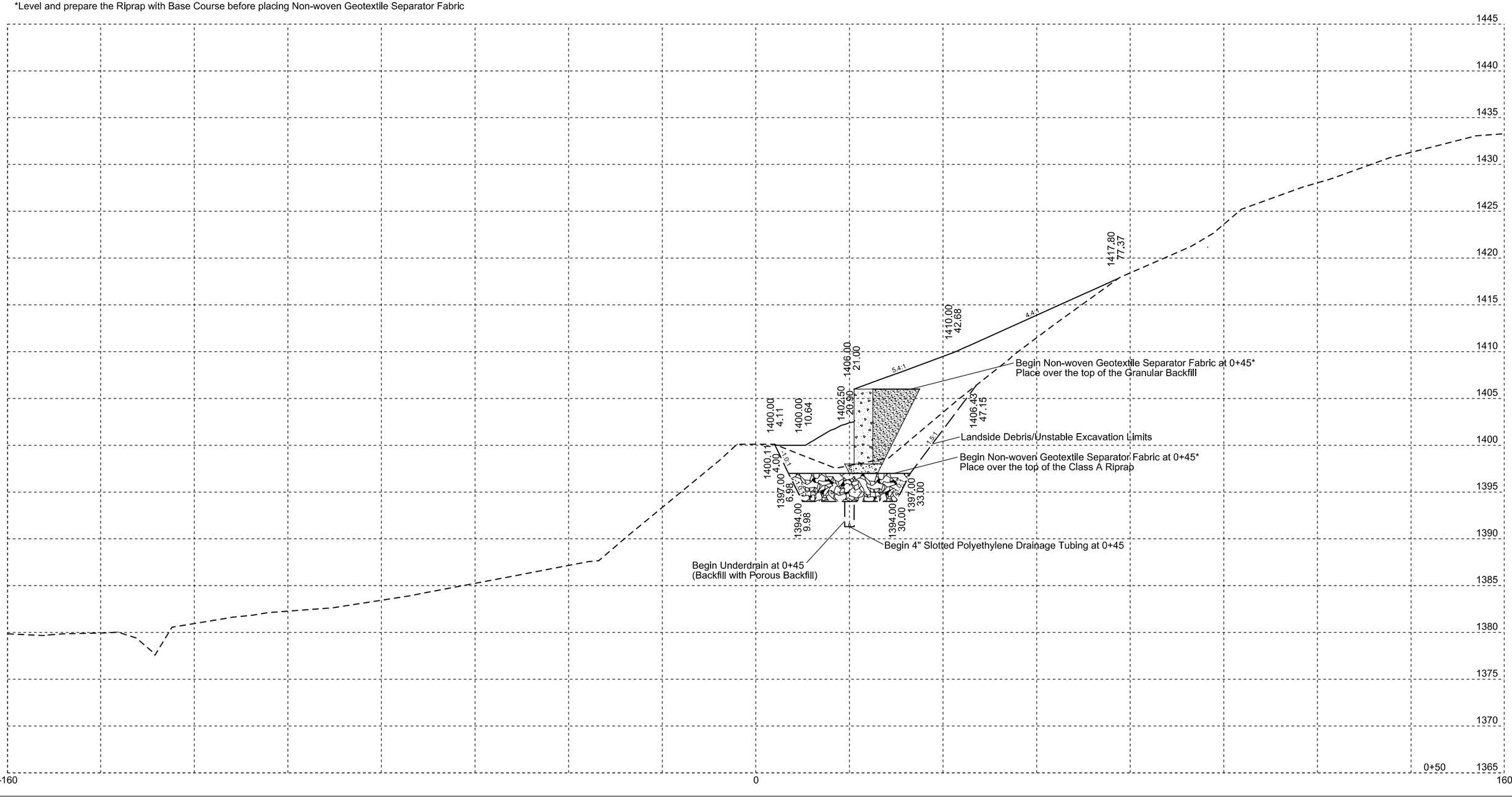
Large Concrete Block Retaining Wall (Begin at 0+45 - See details for 100'-0" Gravity Large Concrete Block Retaining Wall)

Granular Backfill (Begin at 0+45 - See details for 100'-0" Gravity Large Concrete Block Retaining Wall)

Granular Leveling Pad (Begin at 0+45 - See details for 100'-0" Gravity Large Concrete Block Retaining Wall)

Class A Riprap (Begin at 0+45 - See details for 100'-0" Gravity Large Concrete Block Retaining Wall)

*Level and prepare the Riprap with Base Course before placing Non-woven Geotextile Separator Fabric



Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	29	72

STR. NO. 43-479-271

(RR ALIGNMENT)

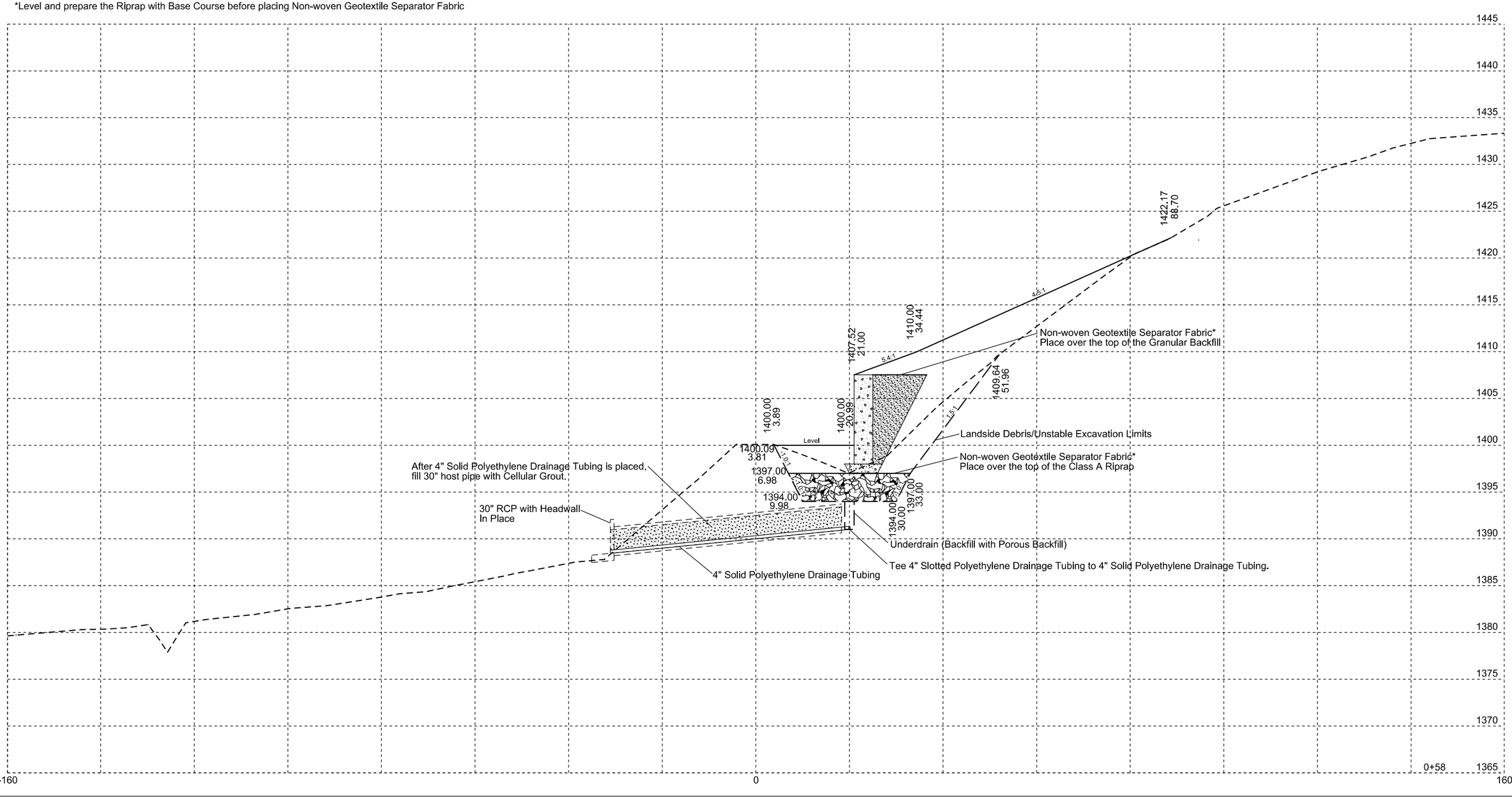
Large Concrete Block Retaining Wall (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)

Granular Backfill (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)

Granular Leveling Pad (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)

Class A Riprap (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)

*Level and prepare the Riprap with Base Course before placing Non-woven Geotextile Separator Fabric



Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	30	72

STR. NO. 43-479-271

(RR ALIGNMENT)

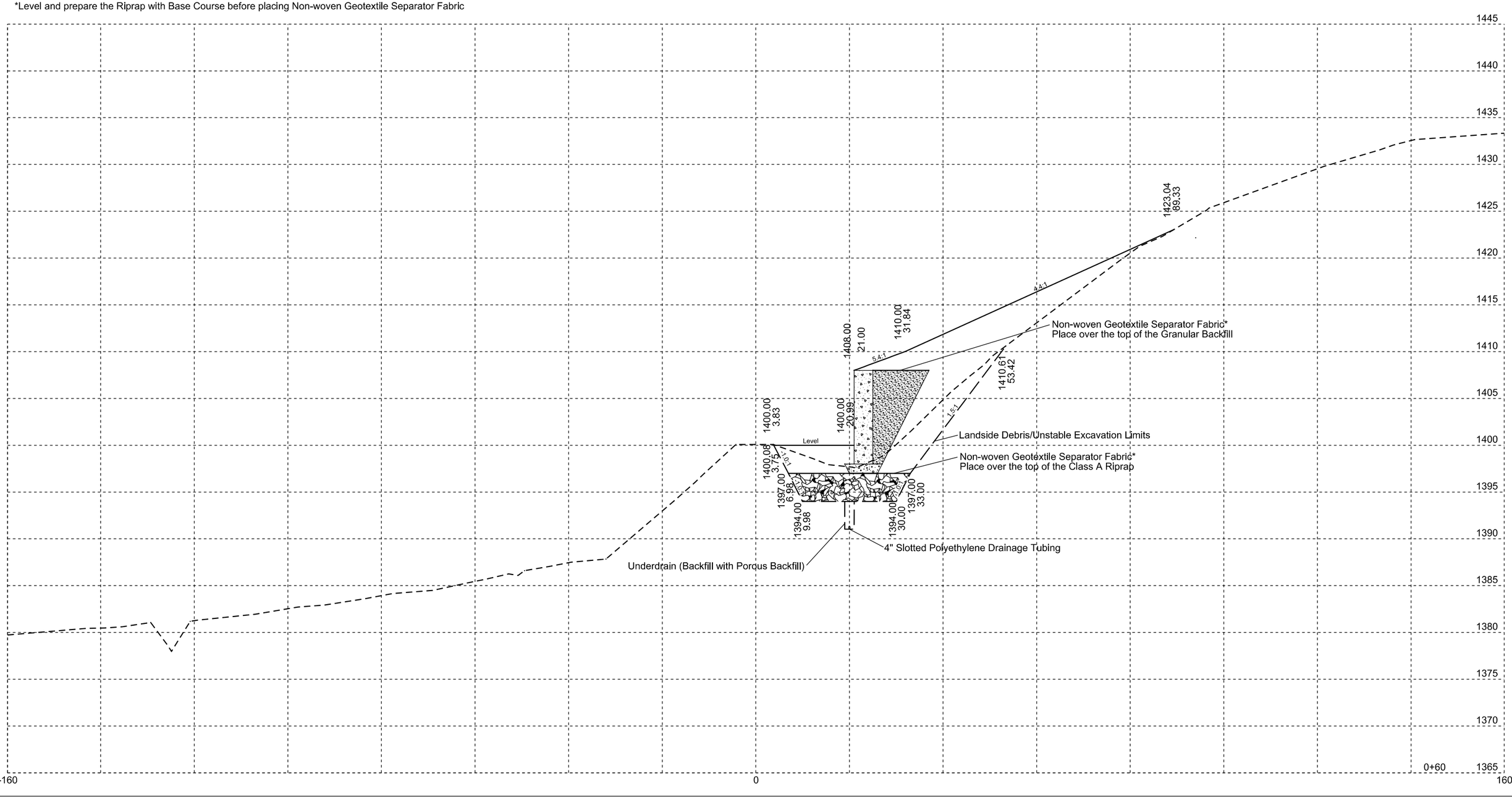
Large Concrete Block Retaining Wall (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)

Granular Backfill (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)

Granular Leveling Pad (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)

Class A Riprap (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)

*Level and prepare the Riprap with Base Course before placing Non-woven Geotextile Separator Fabric



Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	31	72

STR. NO. 43-479-271

(RR ALIGNMENT)

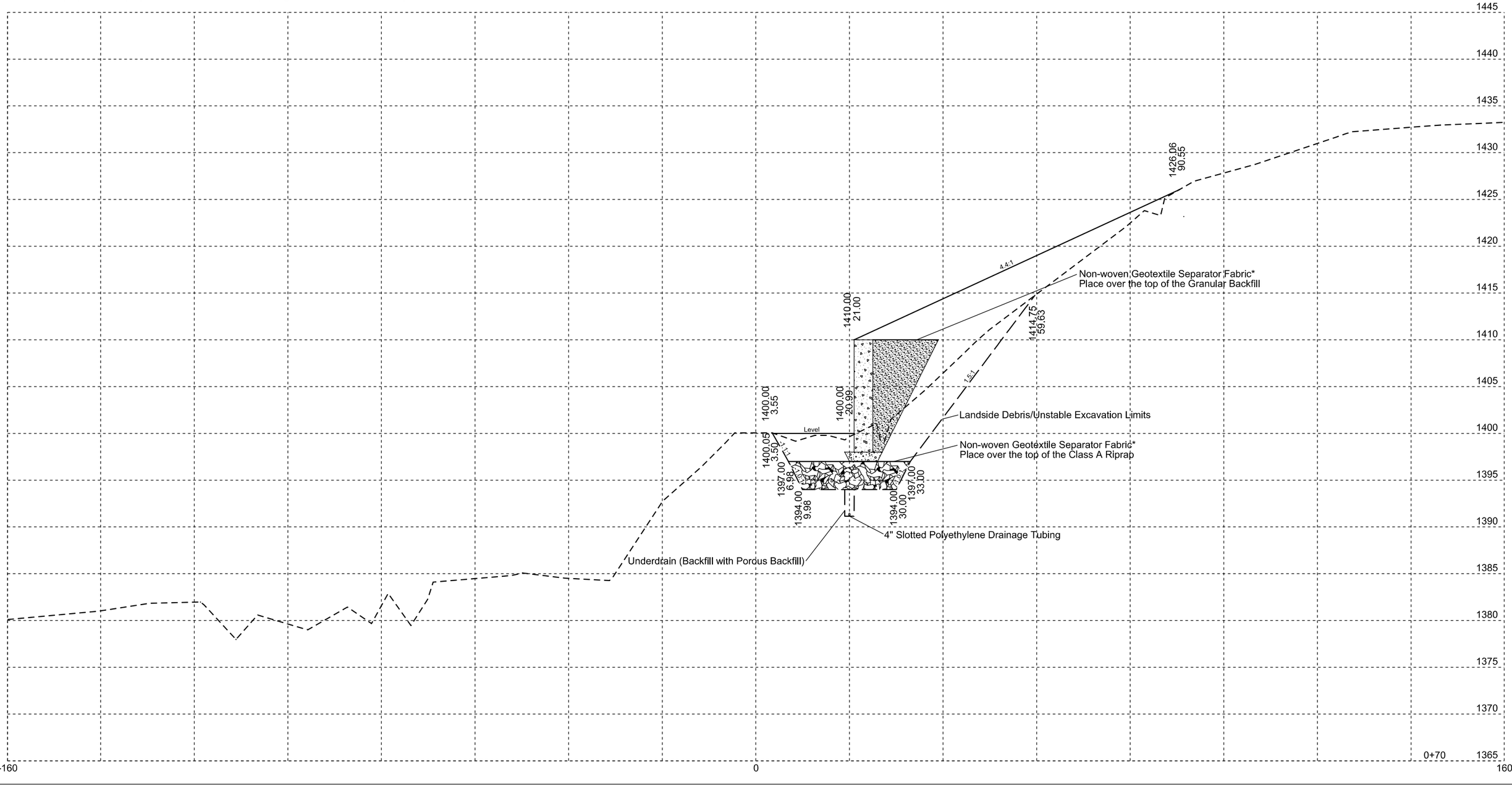
Large Concrete Block Retaining Wall (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)

Granular Backfill (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)

Granular Leveling Pad (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)

Class A Riprap (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)

*Level and prepare the Riprap with Base Course before placing Non-woven Geotextile Separator Fabric



Plotting Date: 06/13/2014

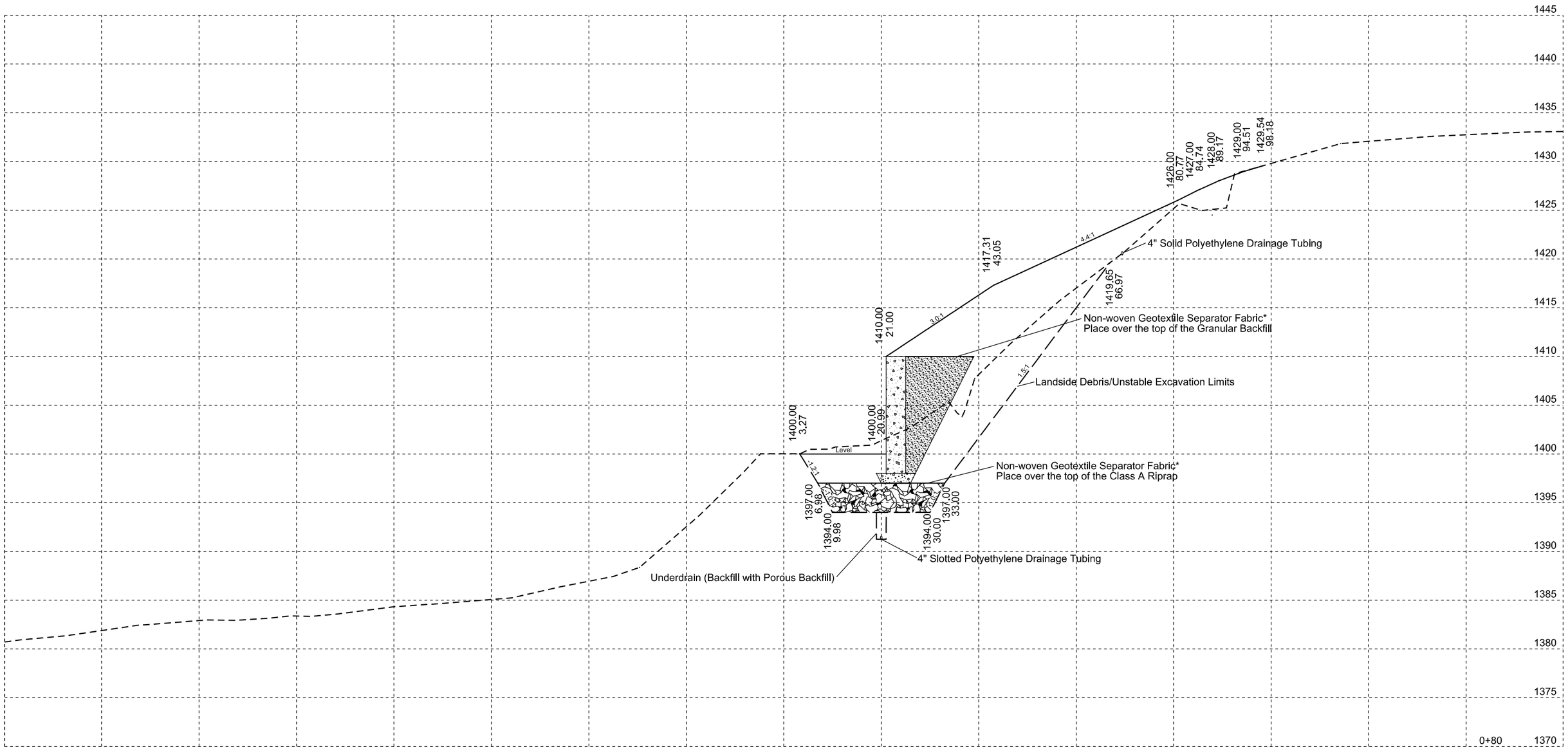
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	32	72

STR. NO. 43-479-271

(RR ALIGNMENT)

- Large Concrete Block Retaining Wall (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)
- Granular Backfill (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)
- Granular Leveling Pad (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)
- Class A Riprap (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)

*Level and prepare the Riprap with Base Course before placing Non-woven Geotextile Separator Fabric



Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	33	72

STR. NO. 43-479-271

(RR ALIGNMENT)

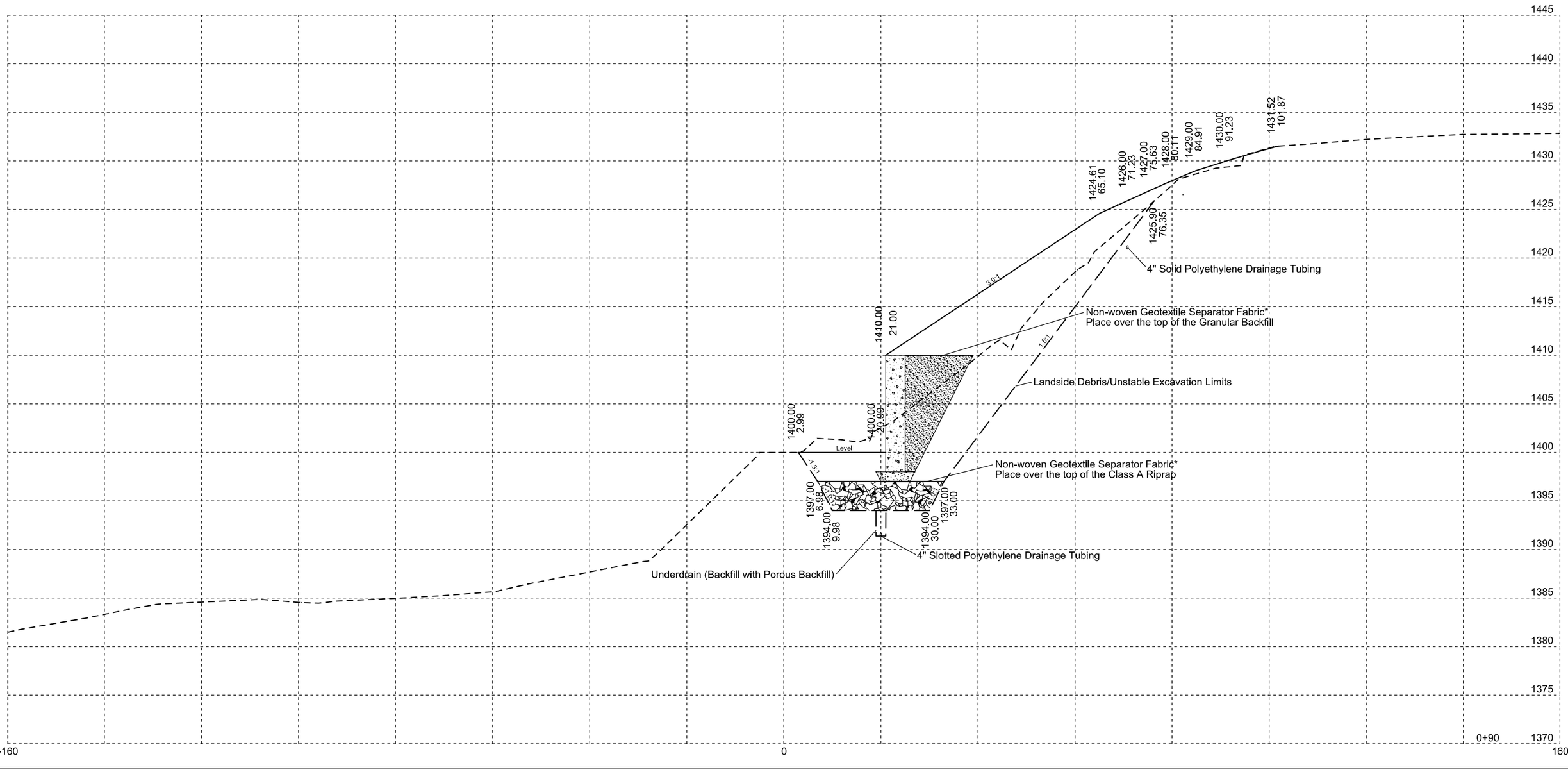
Large Concrete Block Retaining Wall (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)

Granular Backfill (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)

Granular Leveling Pad (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)

Class A Riprap (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)

*Level and prepare the Riprap with Base Course before placing Non-woven Geotextile Separator Fabric



Plotting Date: 06/13/2014

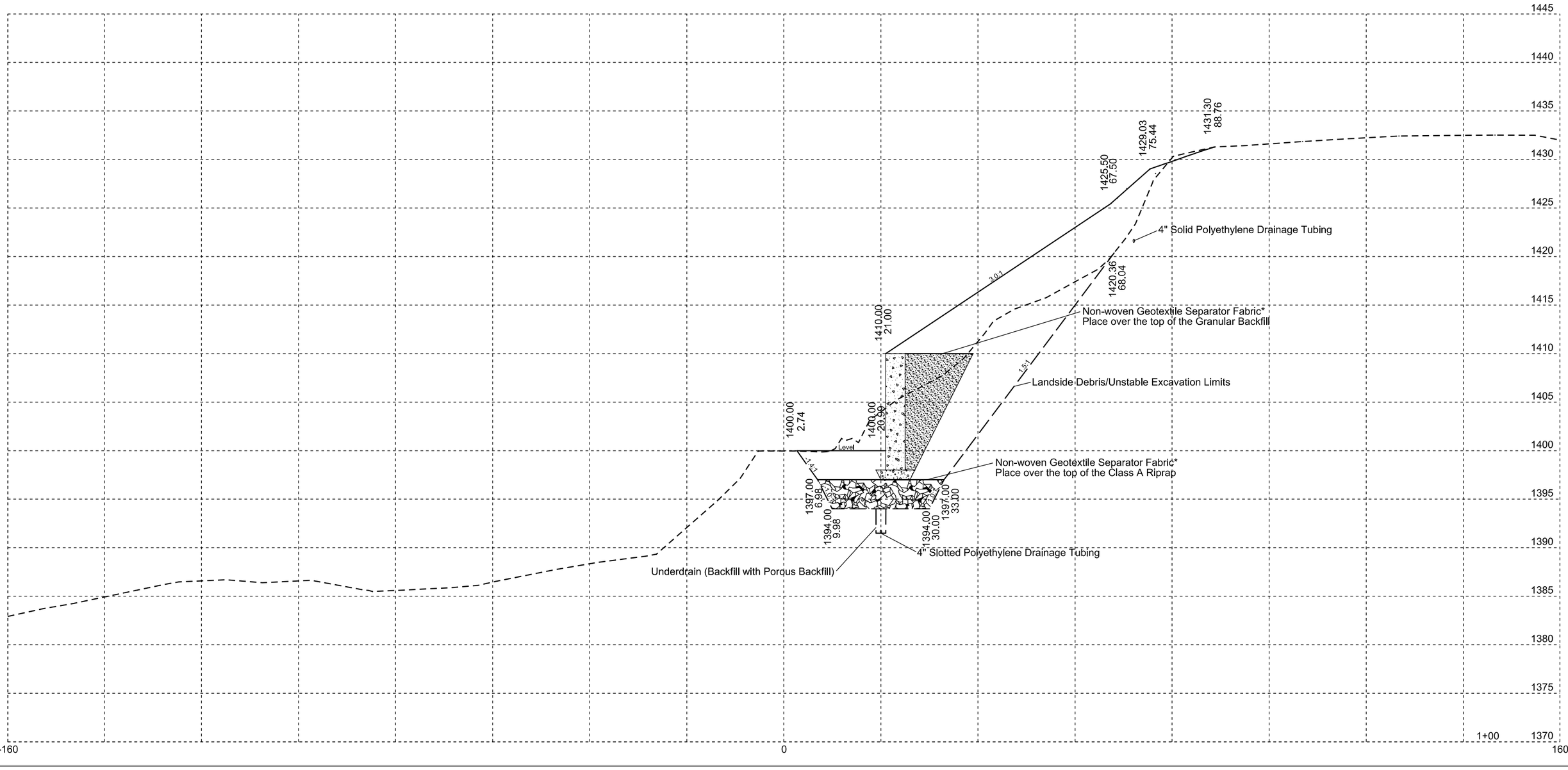
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	34	72

STR. NO. 43-479-271

(RR ALIGNMENT)

- Large Concrete Block Retaining Wall (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)
- Granular Backfill (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)
- Granular Leveling Pad (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)
- Class A Riprap (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)

*Level and prepare the Riprap with Base Course before placing Non-woven Geotextile Separator Fabric



Plotting Date: 06/13/2014

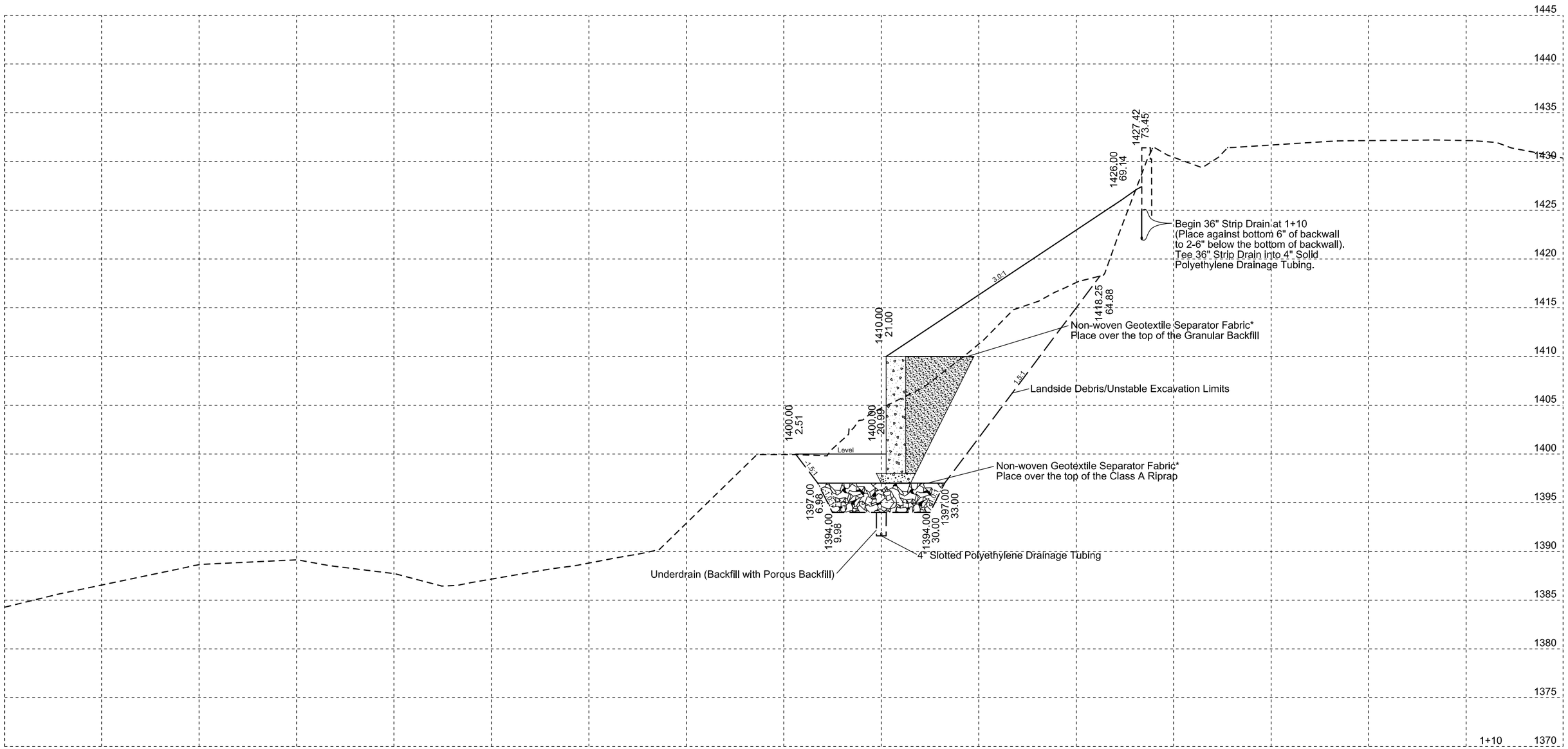
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	35	72

STR. NO. 43-479-271

(RR ALIGNMENT)

- Large Concrete Block Retaining Wall (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)
- Granular Backfill (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)
- Granular Leveling Pad (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)
- Class A Riprap (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)

*Level and prepare the Riprap with Base Course before placing Non-woven Geotextile Separator Fabric



Plotting Date: 06/13/2014

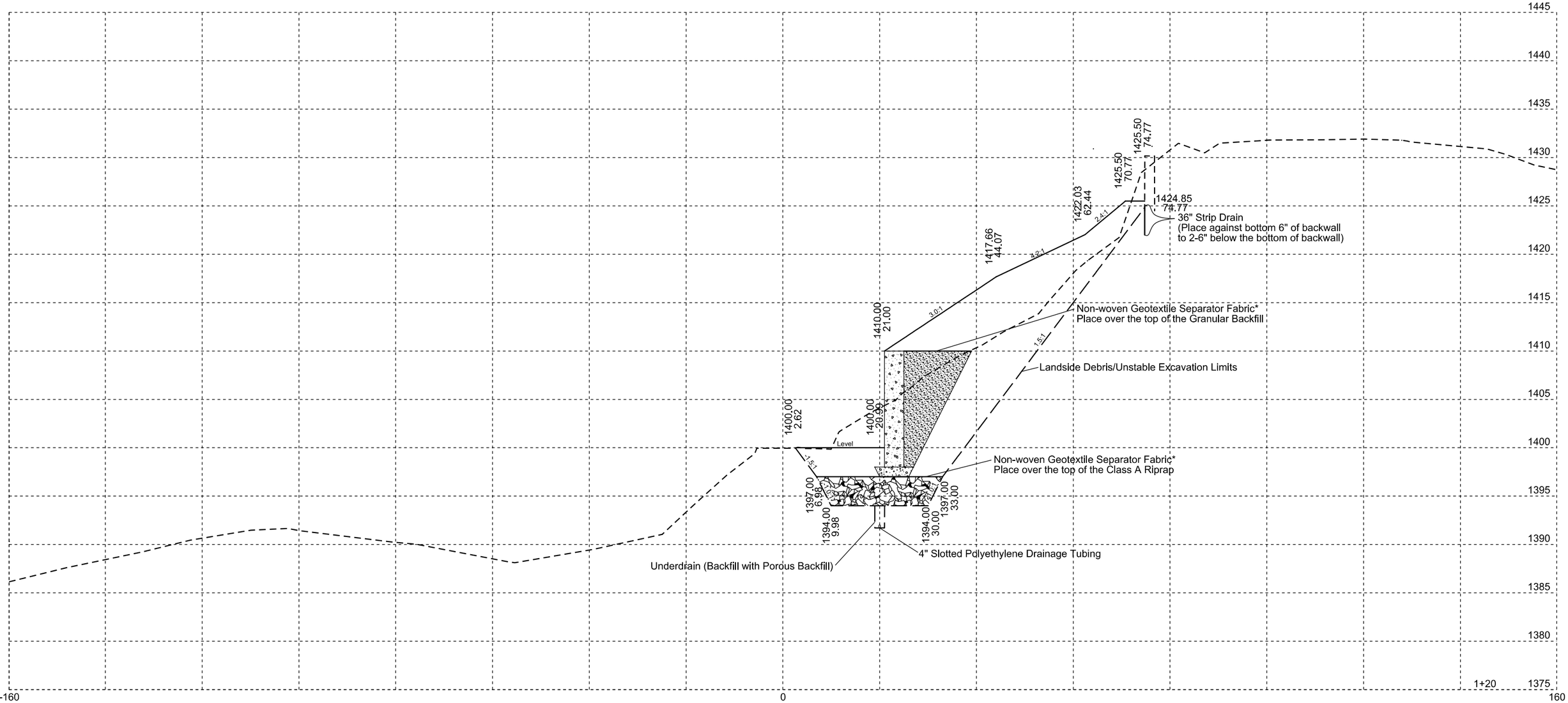
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	36	72

STR. NO. 43-479-271

(RR ALIGNMENT)

- Large Concrete Block Retaining Wall (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)
- Granular Backfill (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)
- Granular Leveling Pad (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)
- Class A Riprap (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)

*Level and prepare the Riprap with Base Course before placing Non-woven Geotextile Separator Fabric



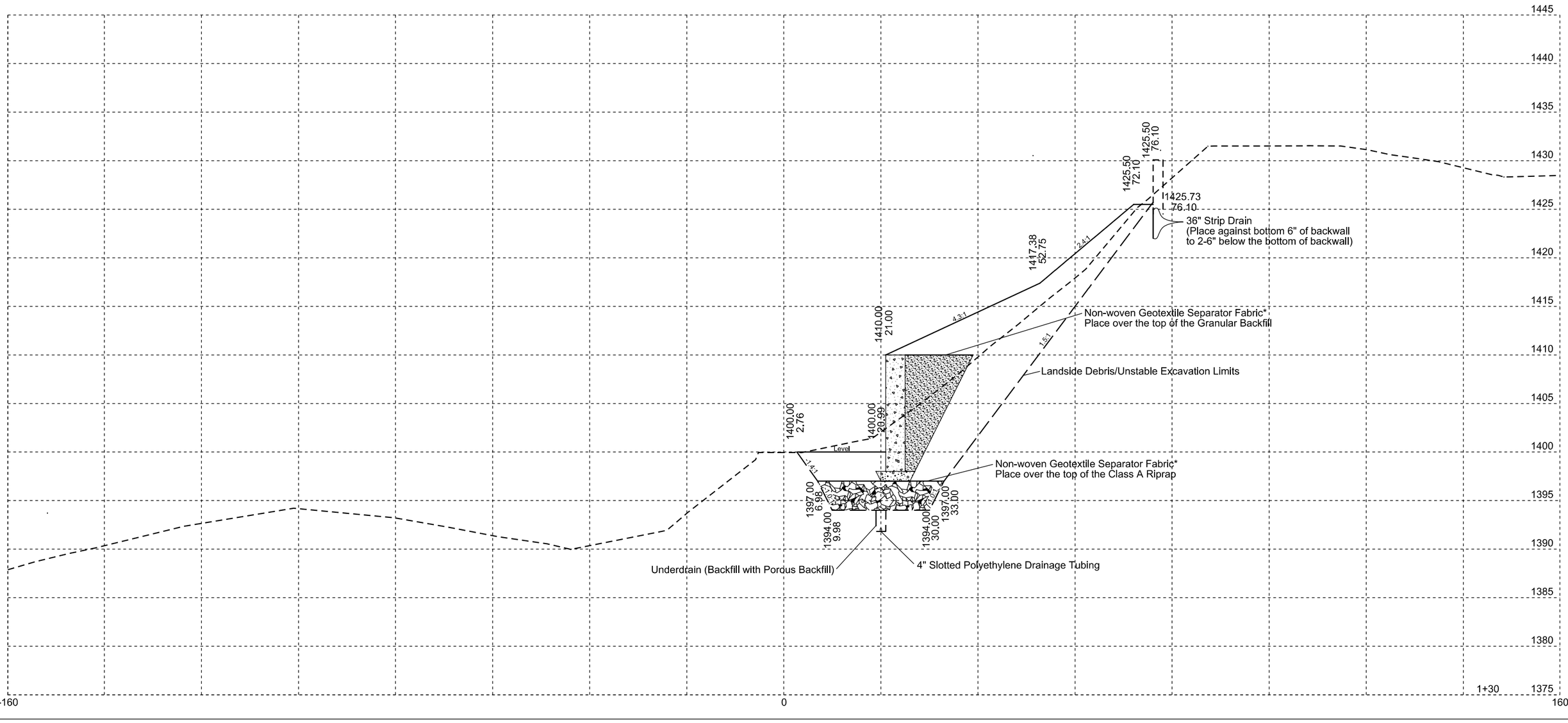
Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	37	72

STR. NO. 43-479-271
(RR ALIGNMENT)

- Large Concrete Block Retaining Wall (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)
- Granular Backfill (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)
- Granular Leveling Pad (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)
- Class A Riprap (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)

*Level and prepare the Riprap with Base Course before placing Non-woven Geotextile Separator Fabric



Plotting Date: 06/13/2014

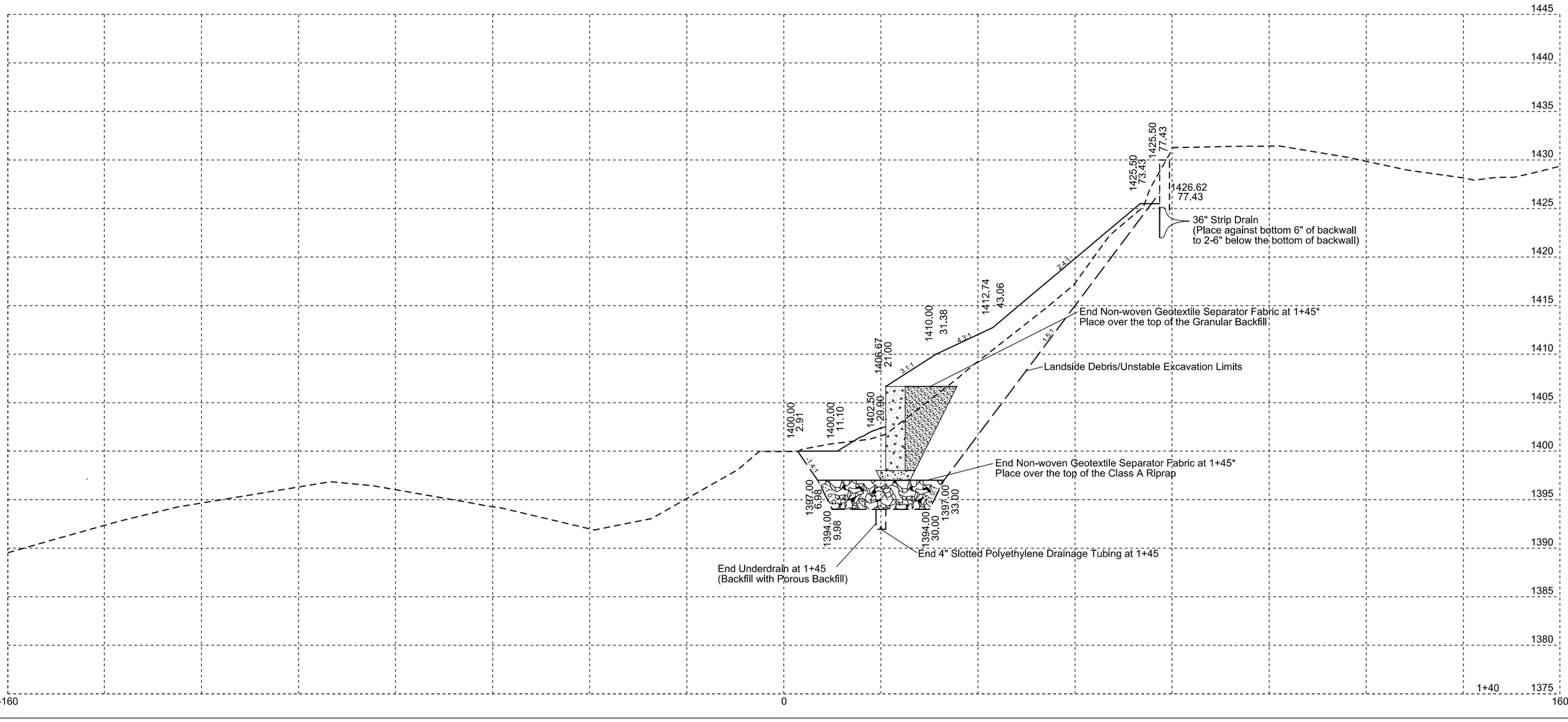
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	38	72

STR. NO. 43-479-271

(RR ALIGNMENT)

- Large Concrete Block Retaining Wall (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)
- Granular Backfill (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)
- Granular Leveling Pad (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)
- Class A Riprap (See details for 100'-0" Gravity Large Concrete Block Retaining Wall)

*Level and prepare the Riprap with Base Course before placing Non-woven Geotextile Separator Fabric

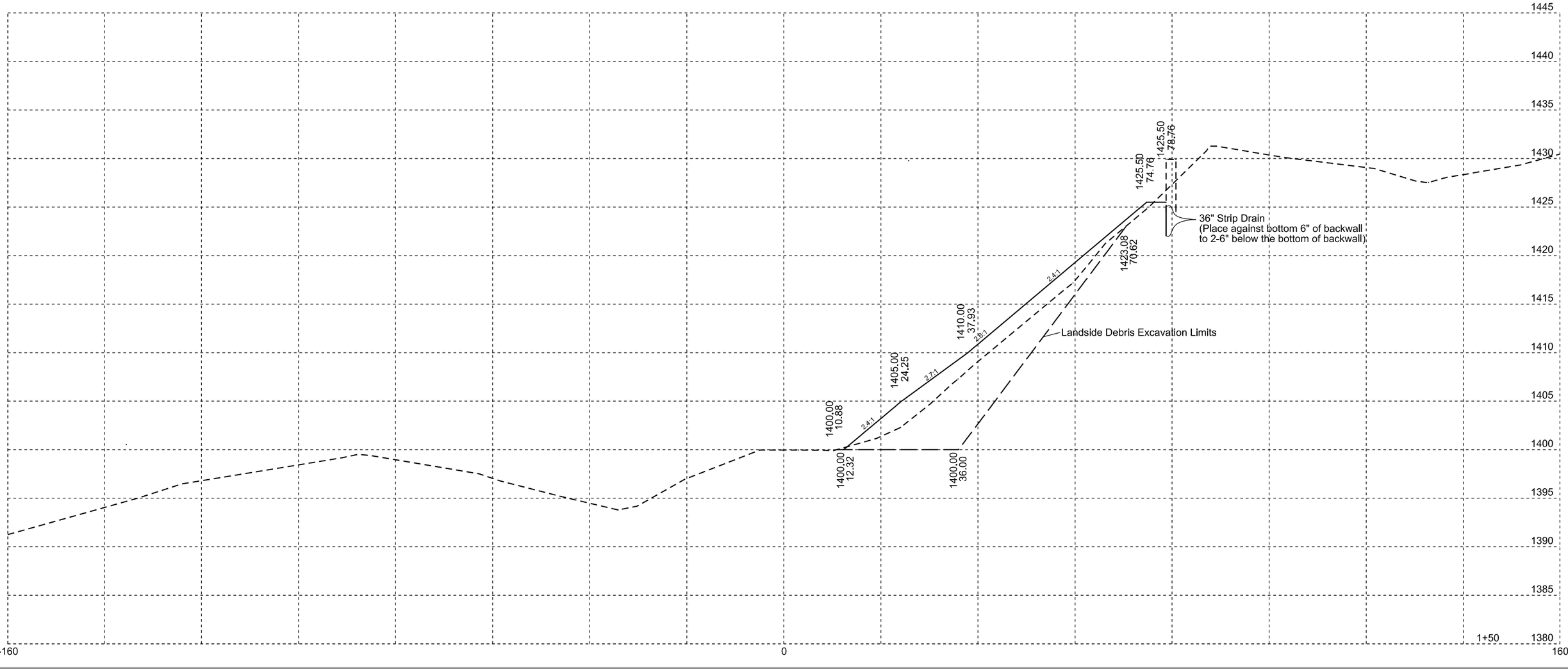


Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	39	72

STR. NO. 43-479-271

(RR ALIGNMENT)

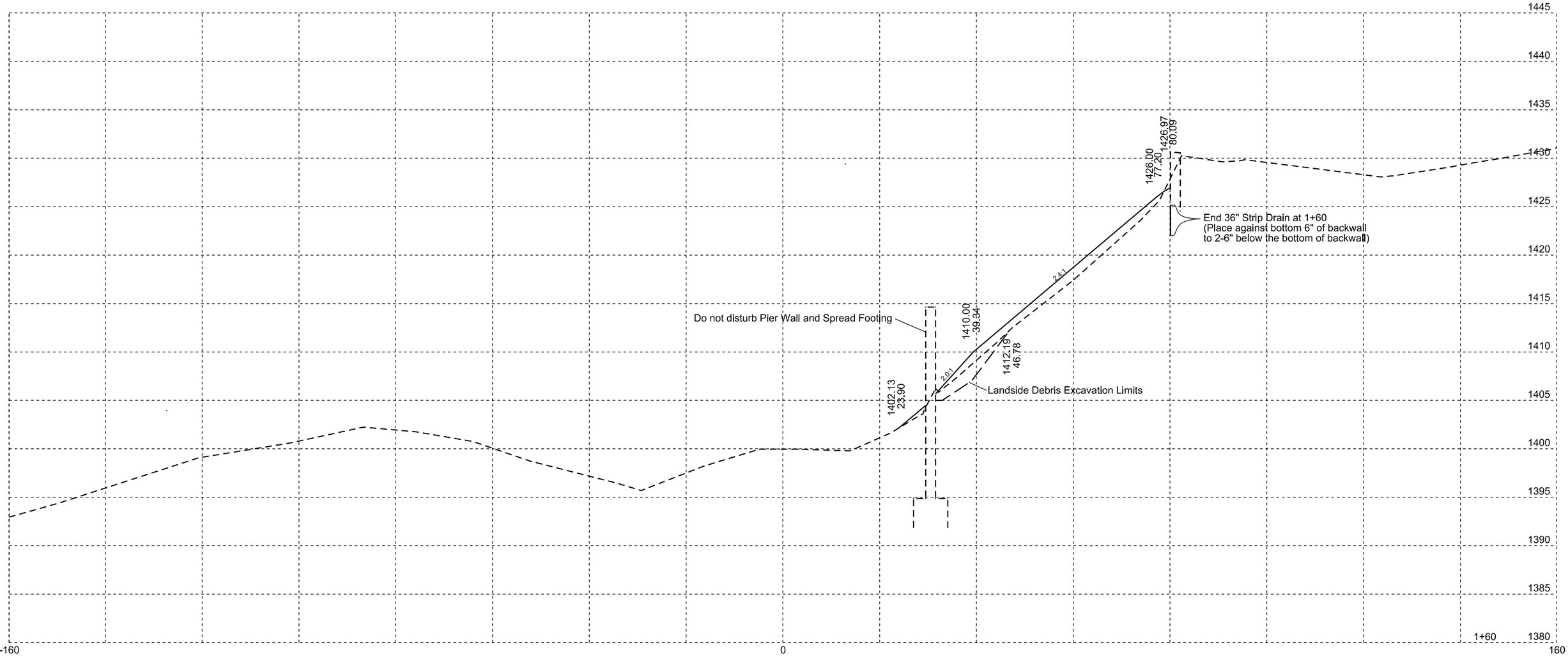


Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	40	72

STR. NO. 43-479-271

(RR ALIGNMENT)

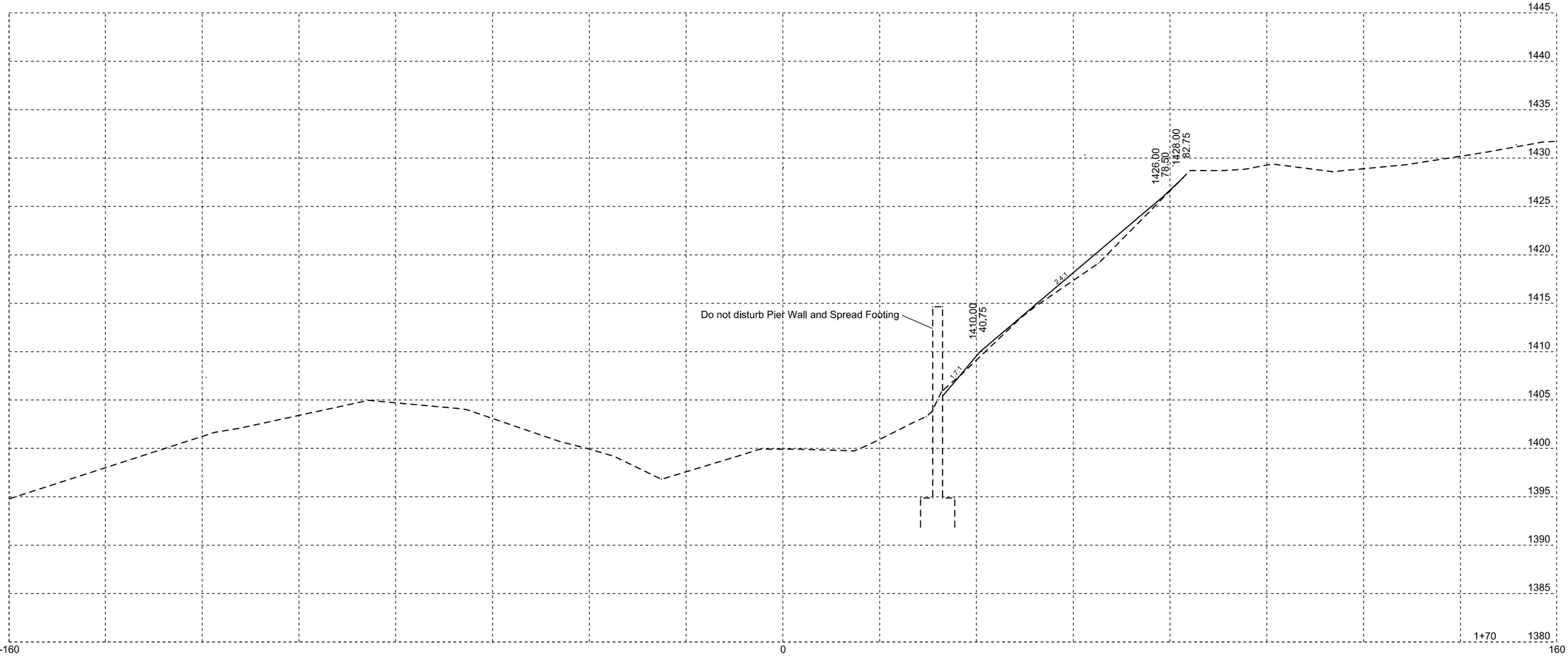


Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	41	72

STR. NO. 43-479-271

(RR ALIGNMENT)

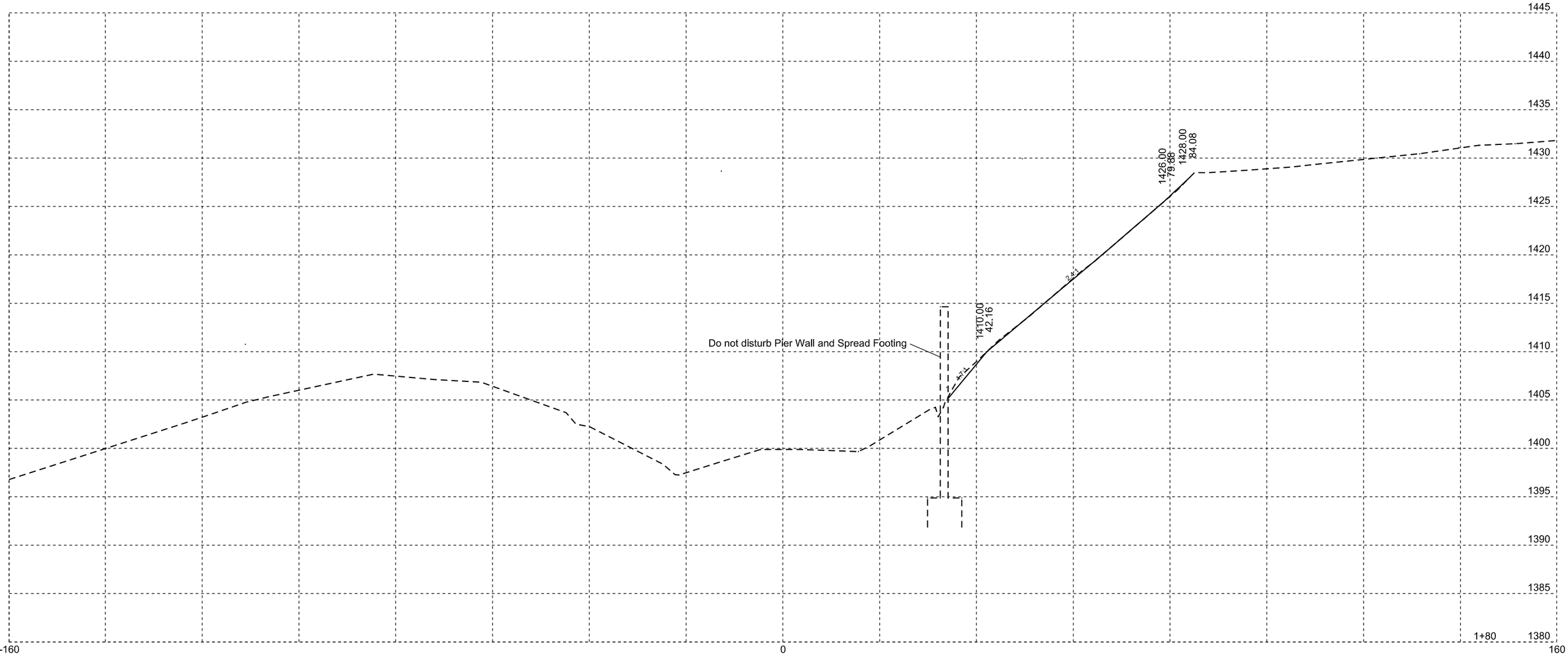


Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	42	72

STR. NO. 43-479-271

(RR ALIGNMENT)

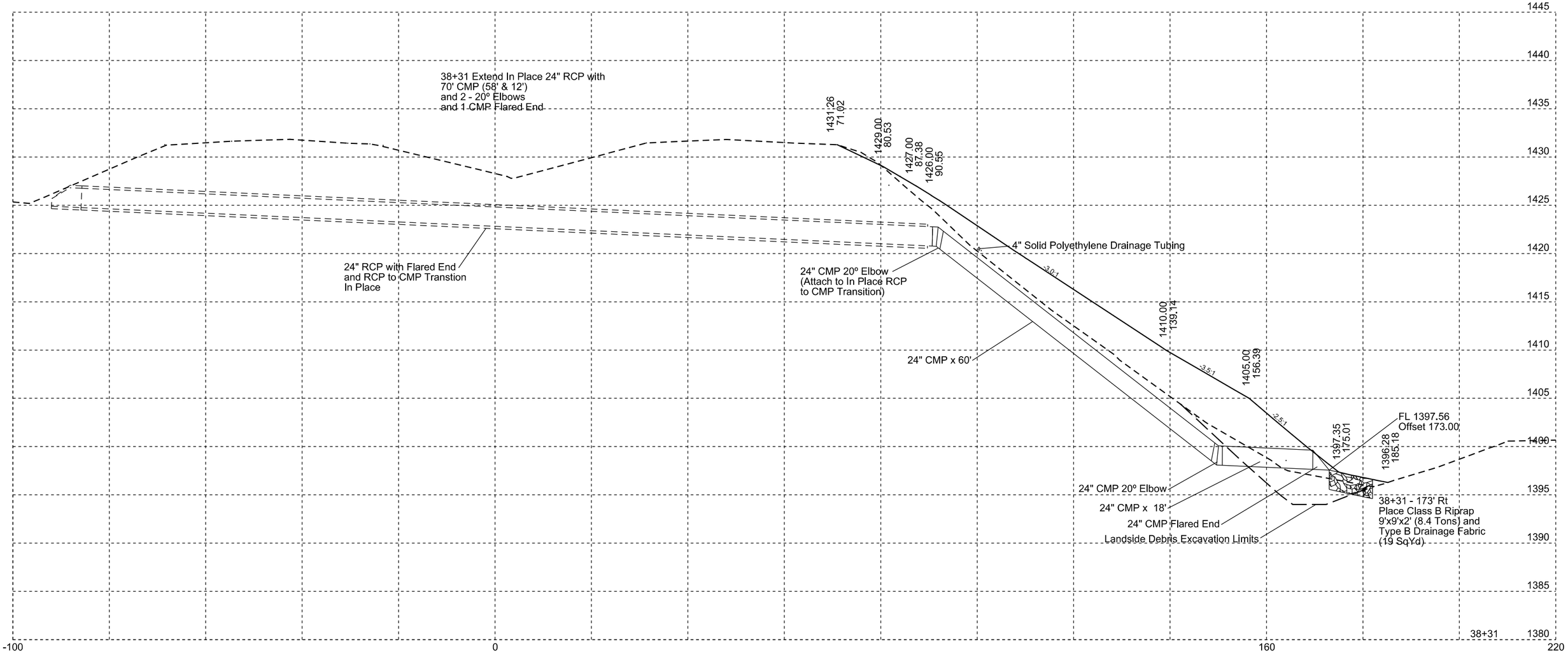


Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	43	72

STR. NO. 43-479-271

(I90 AT OACOMA)

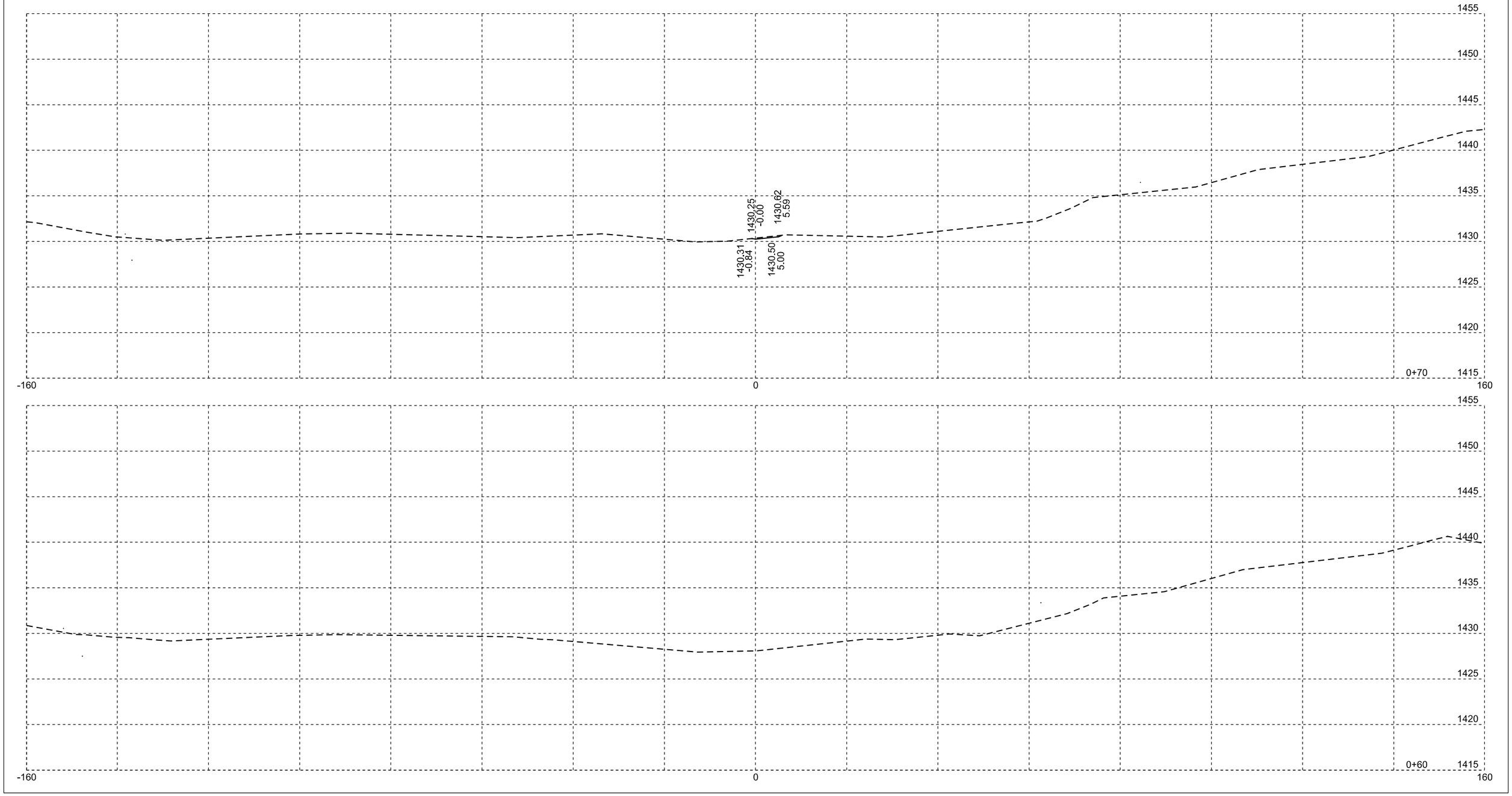


Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	44	72

STR. NO. 43-479-271

(DITCH ALIGNMENT)

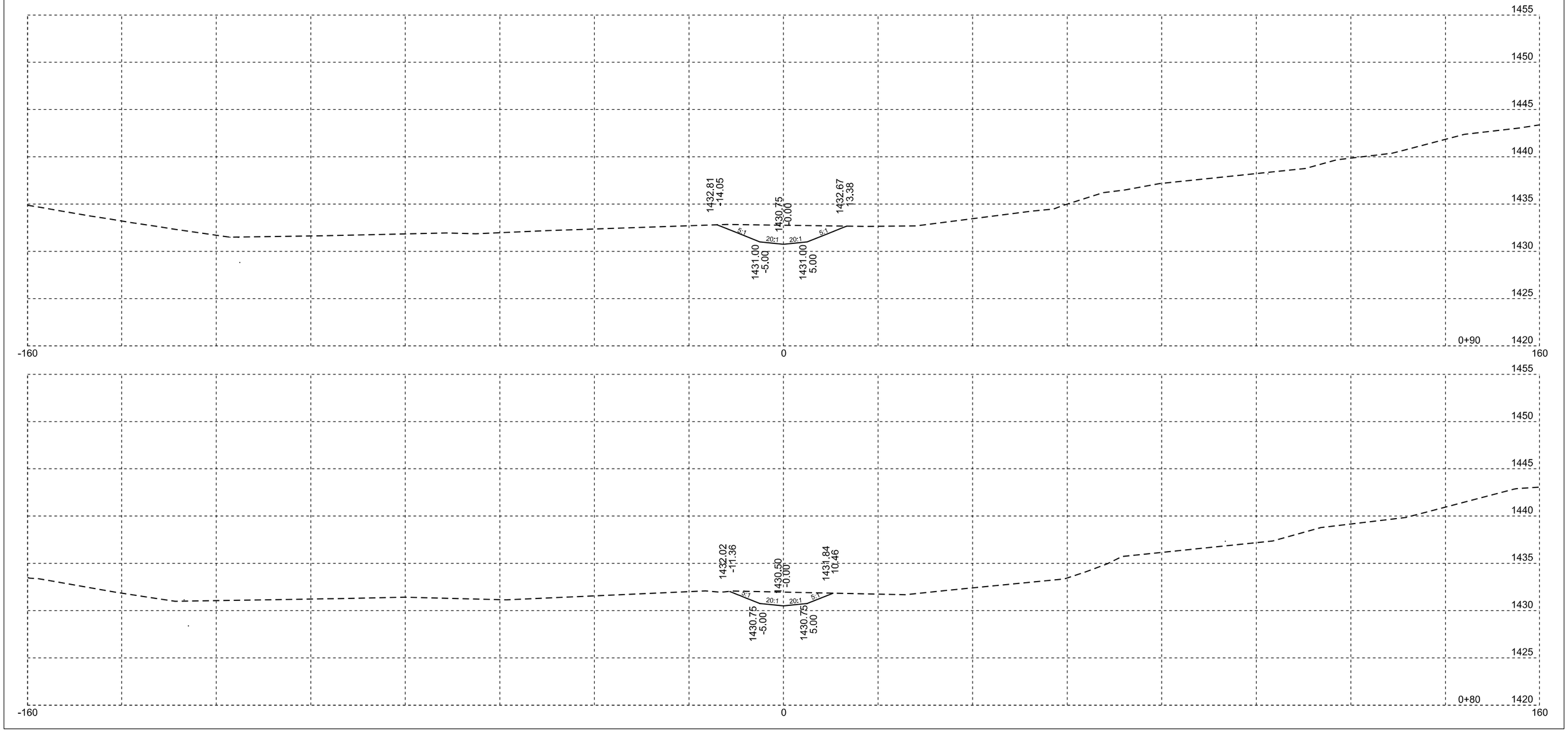


Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	45	72

STR. NO. 43-479-271

(DITCH ALIGNMENT)

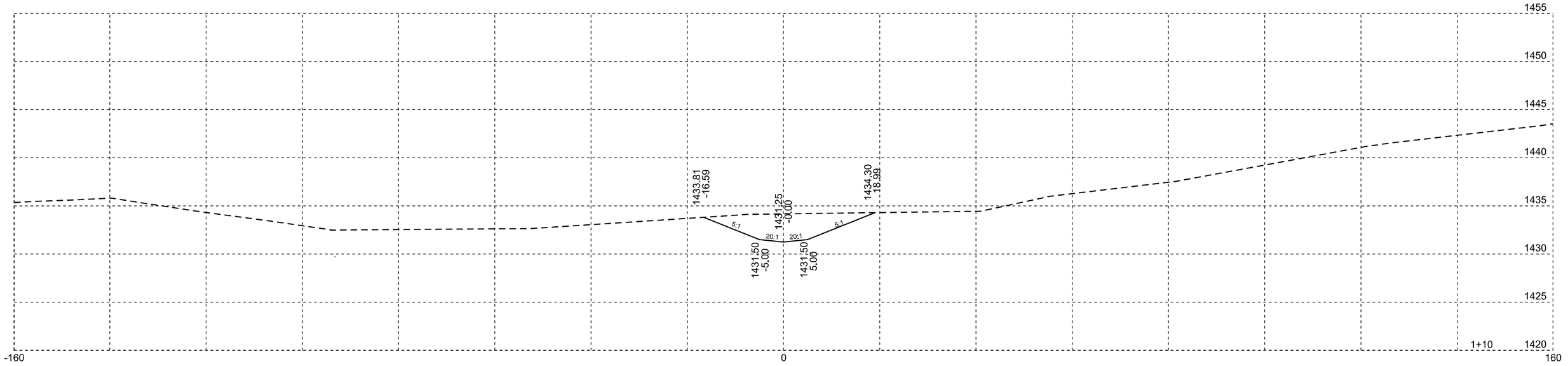


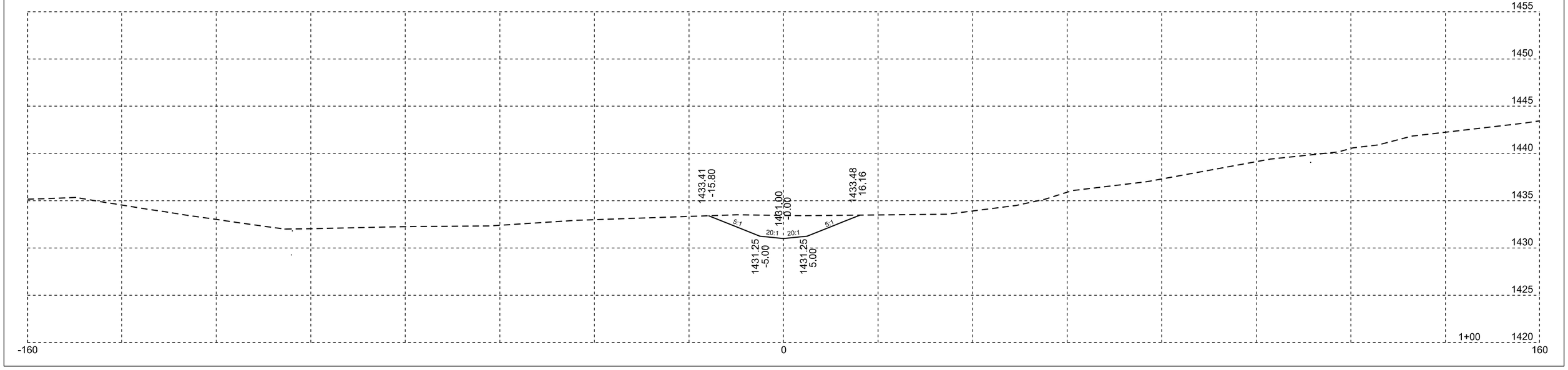
Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	46	72

STR. NO. 43-479-271

(DITCH ALIGNMENT)



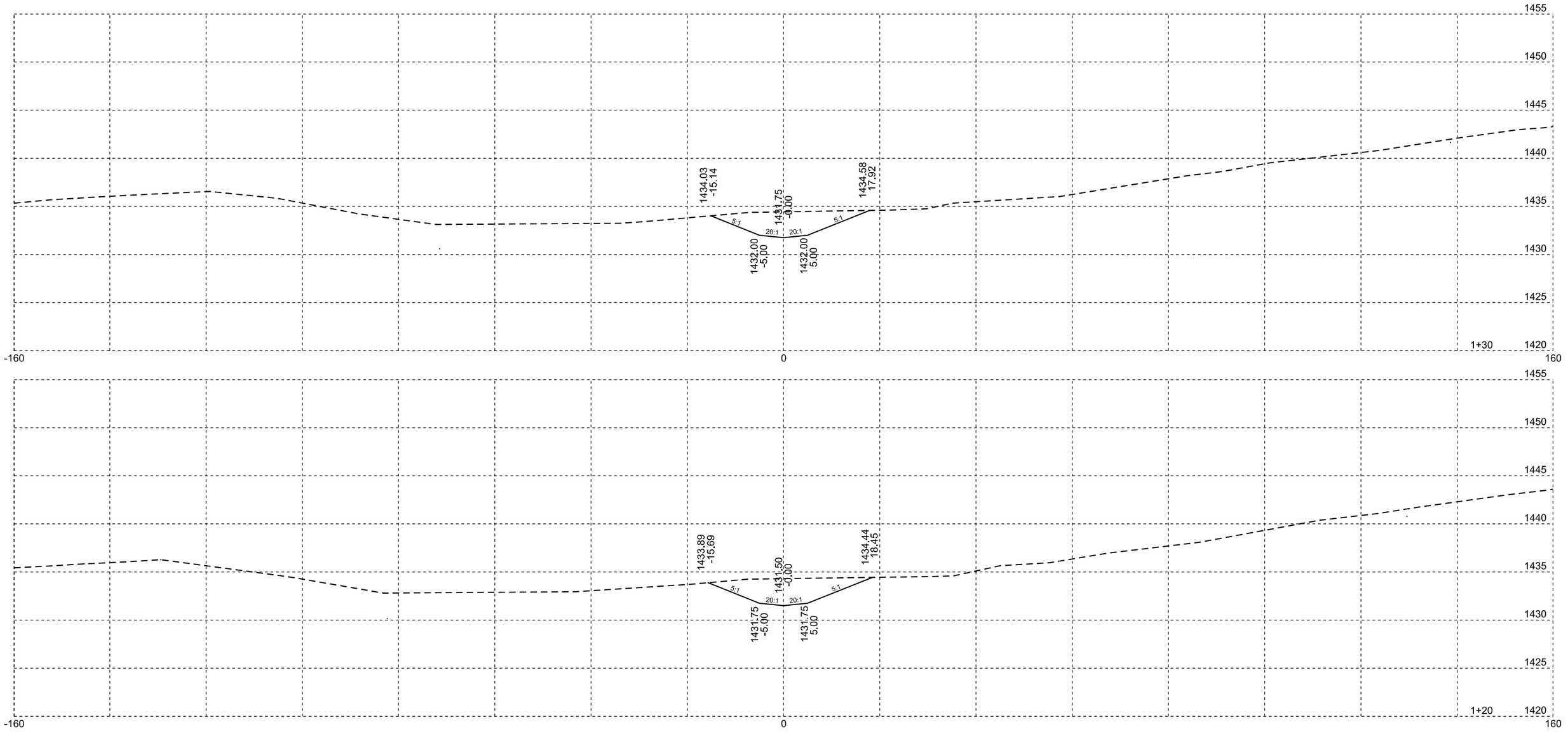


Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	47	72

STR. NO. 43-479-271

(DITCH ALIGNMENT)

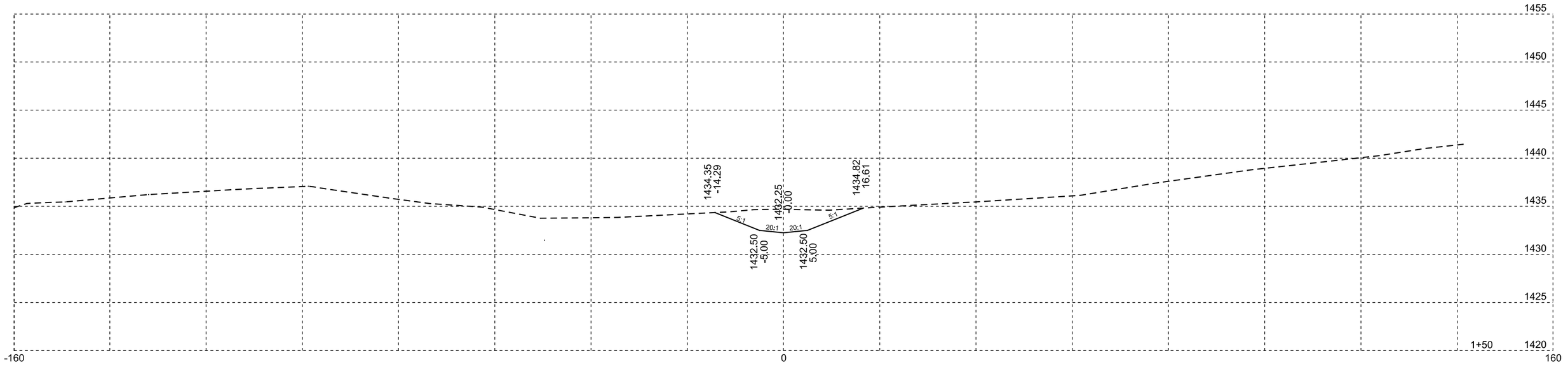


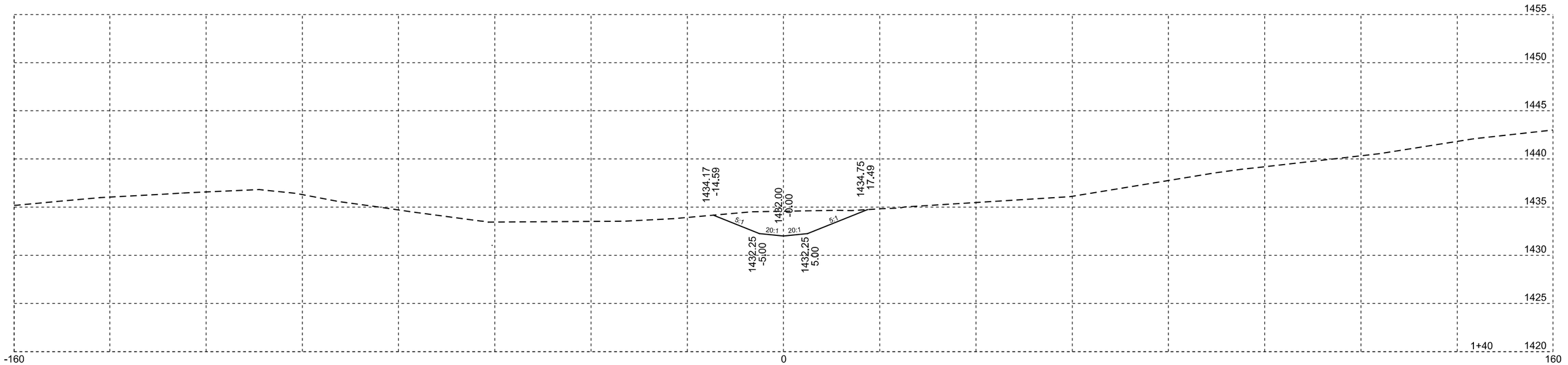
Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	48	72

STR. NO. 43-479-271

(DITCH ALIGNMENT)



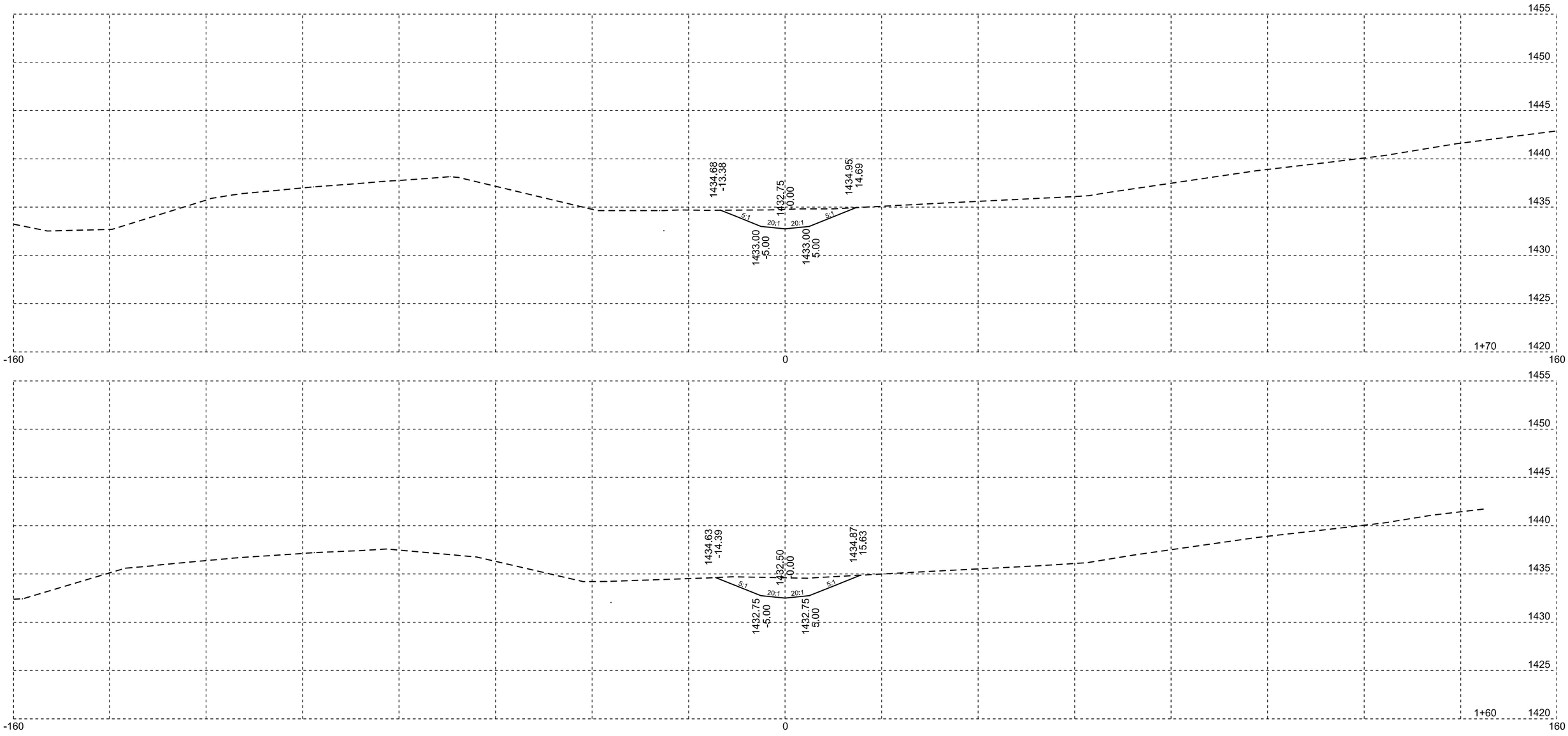


Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	49	72

STR. NO. 43-479-271

(DITCH ALIGNMENT)

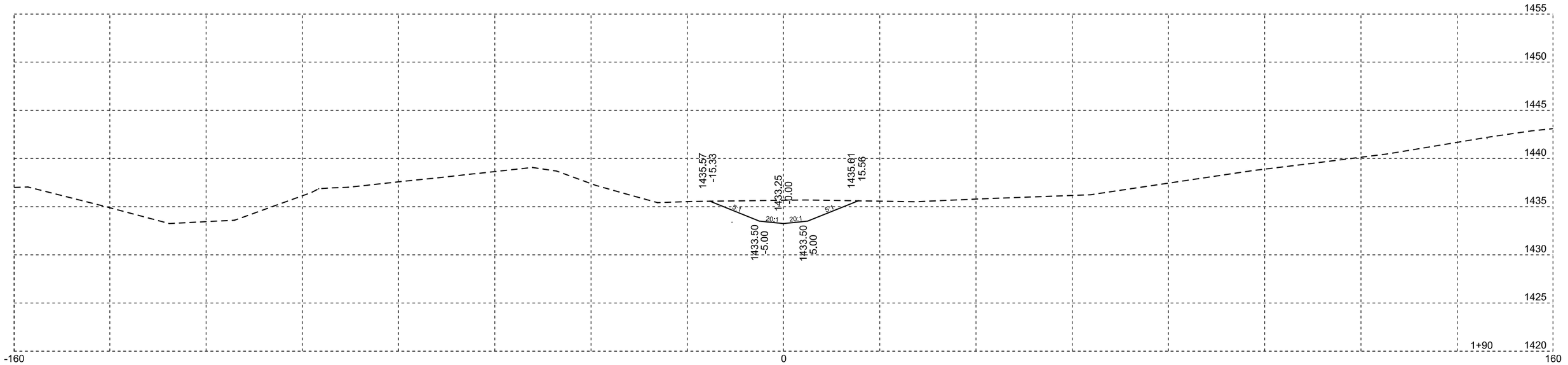


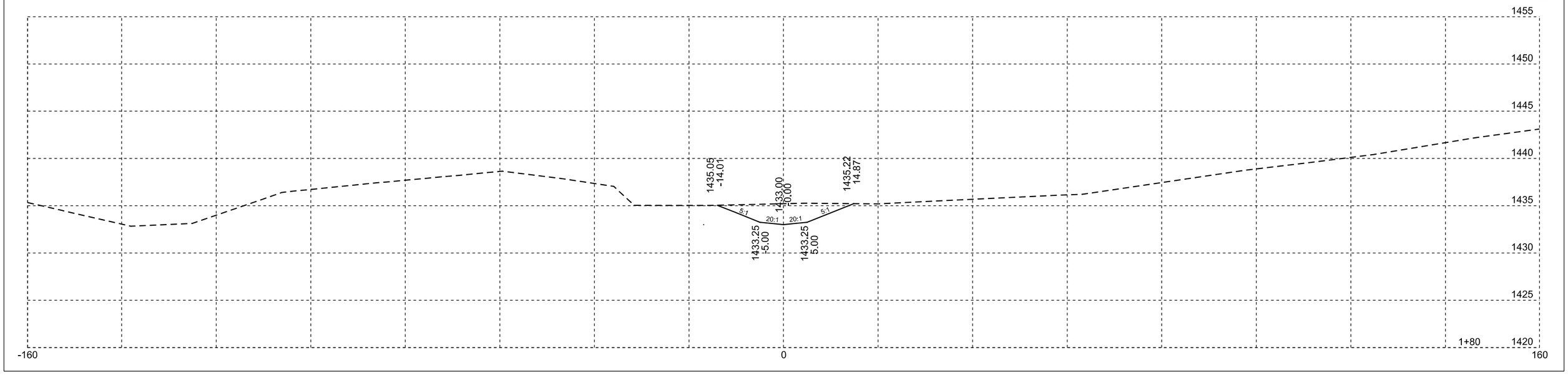
Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	50	72

STR. NO. 43-479-271

(DITCH ALIGNMENT)



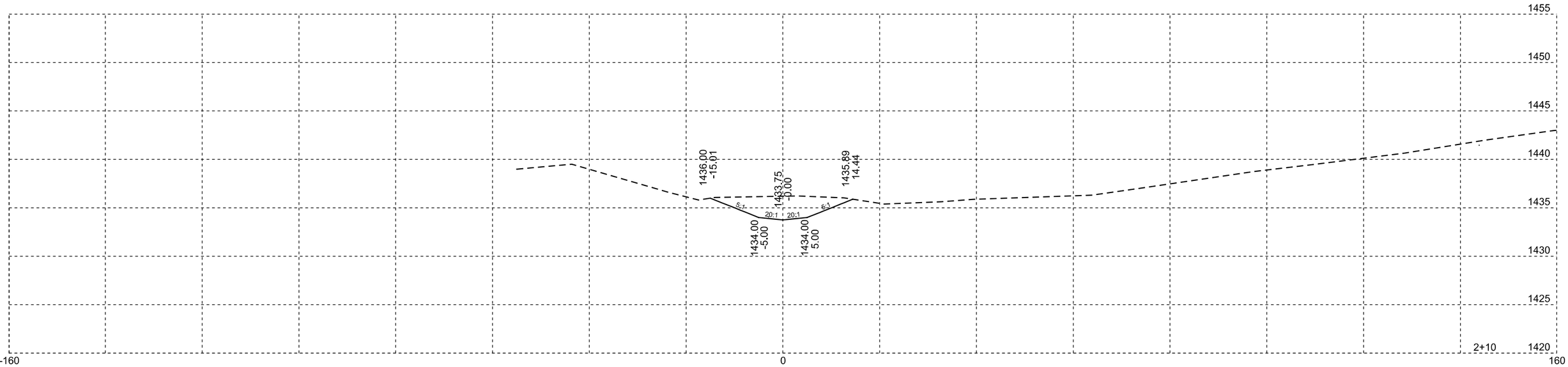


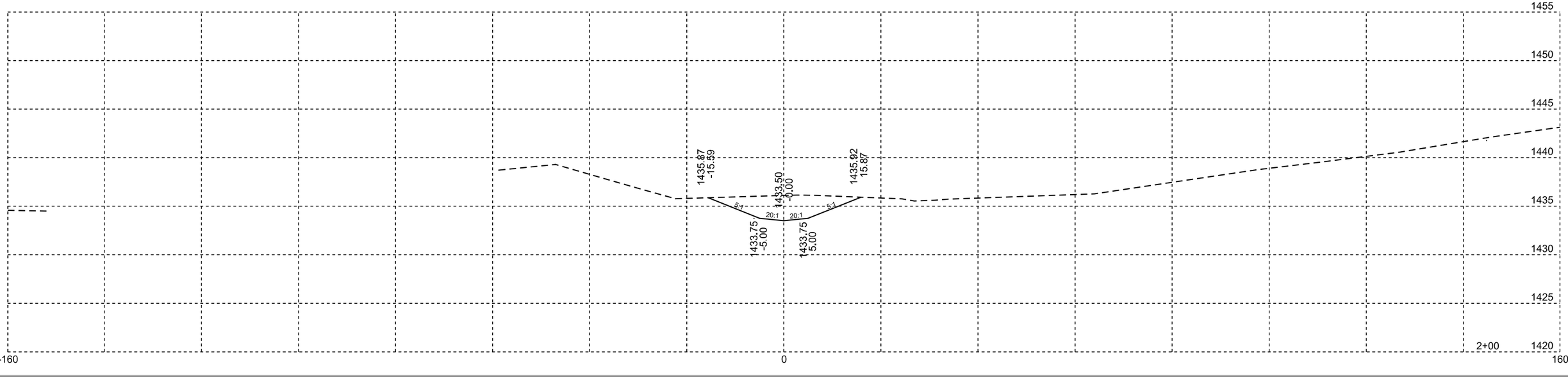
Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	51	72

STR. NO. 43-479-271

(DITCH ALIGNMENT)



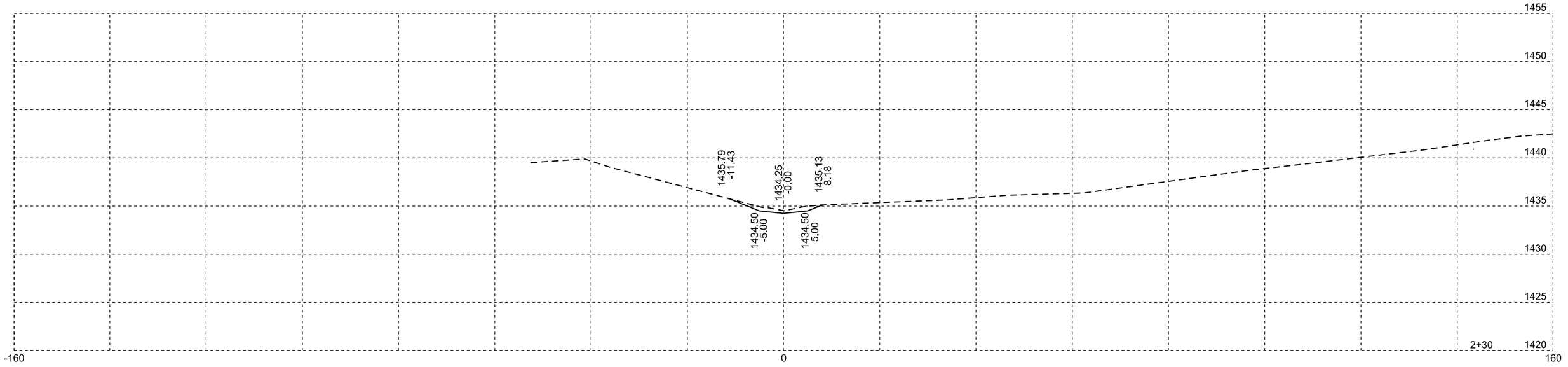


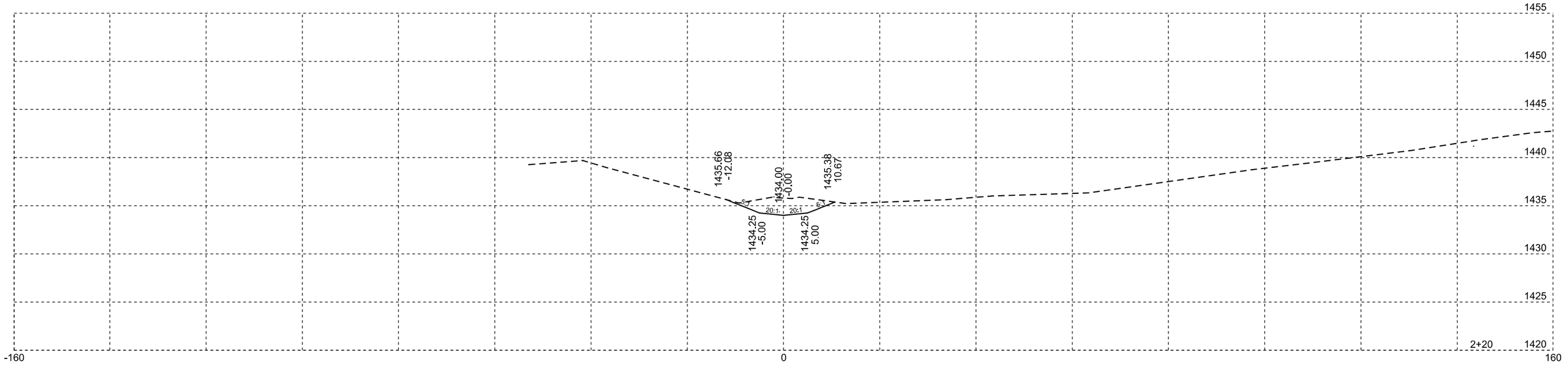
Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	52	72

STR. NO. 43-479-271

(DITCH ALIGNMENT)



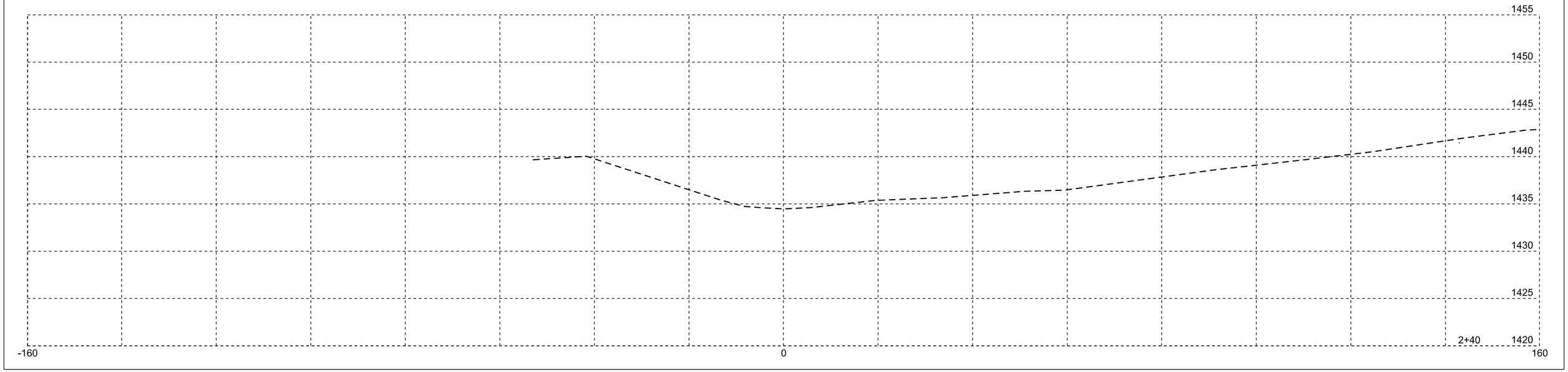


Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	53	72

STR. NO. 43-479-271

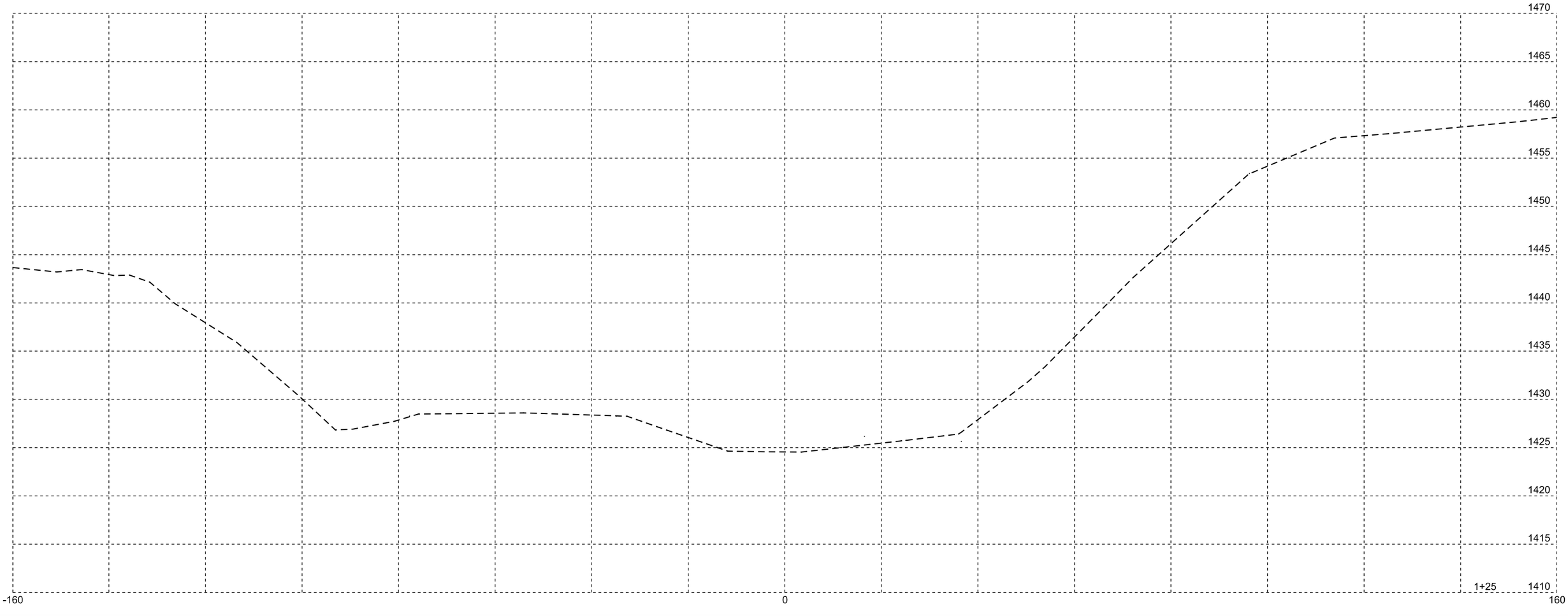
(DITCH ALIGNMENT)



Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	54	72

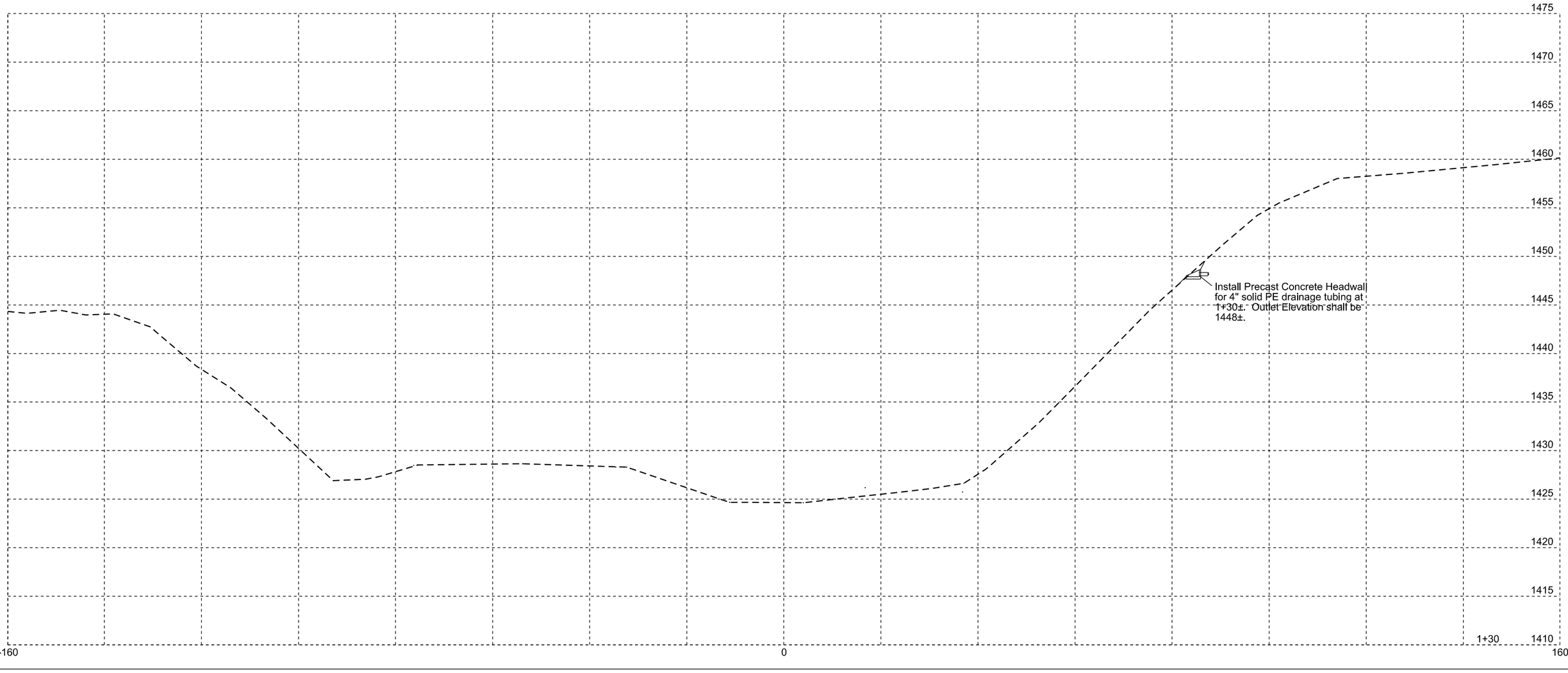
STR. NO. 08-065-095



Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	55	72

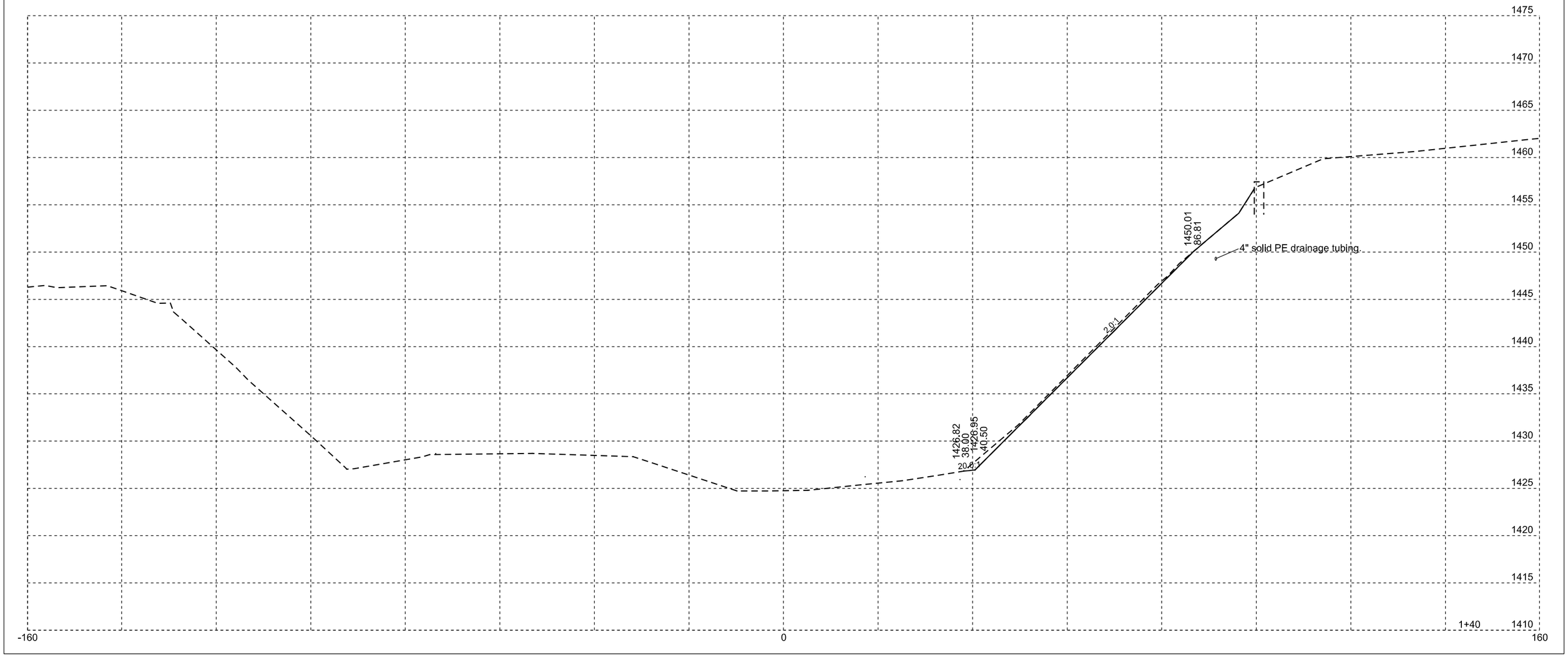
STR. NO. 08-065-095



Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	56	72

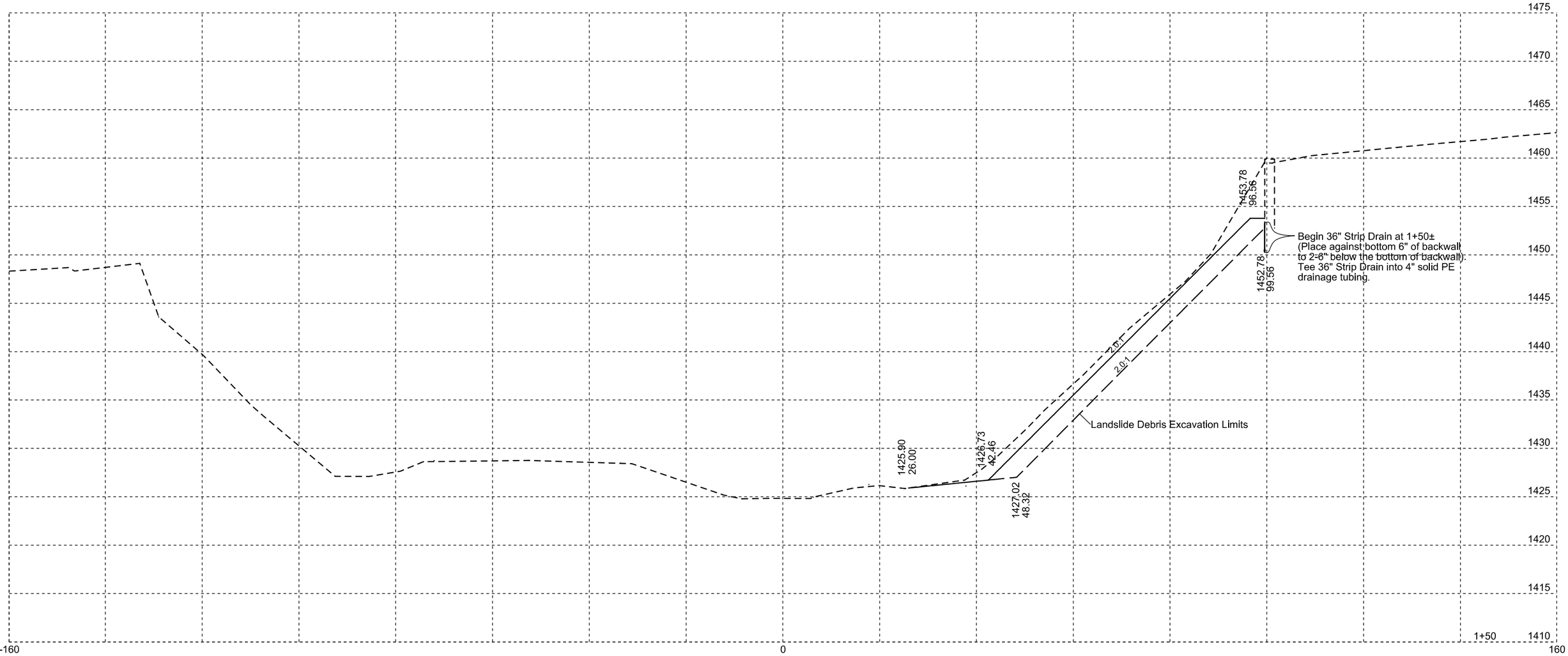
STR. NO. 08-065-095



Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	57	72

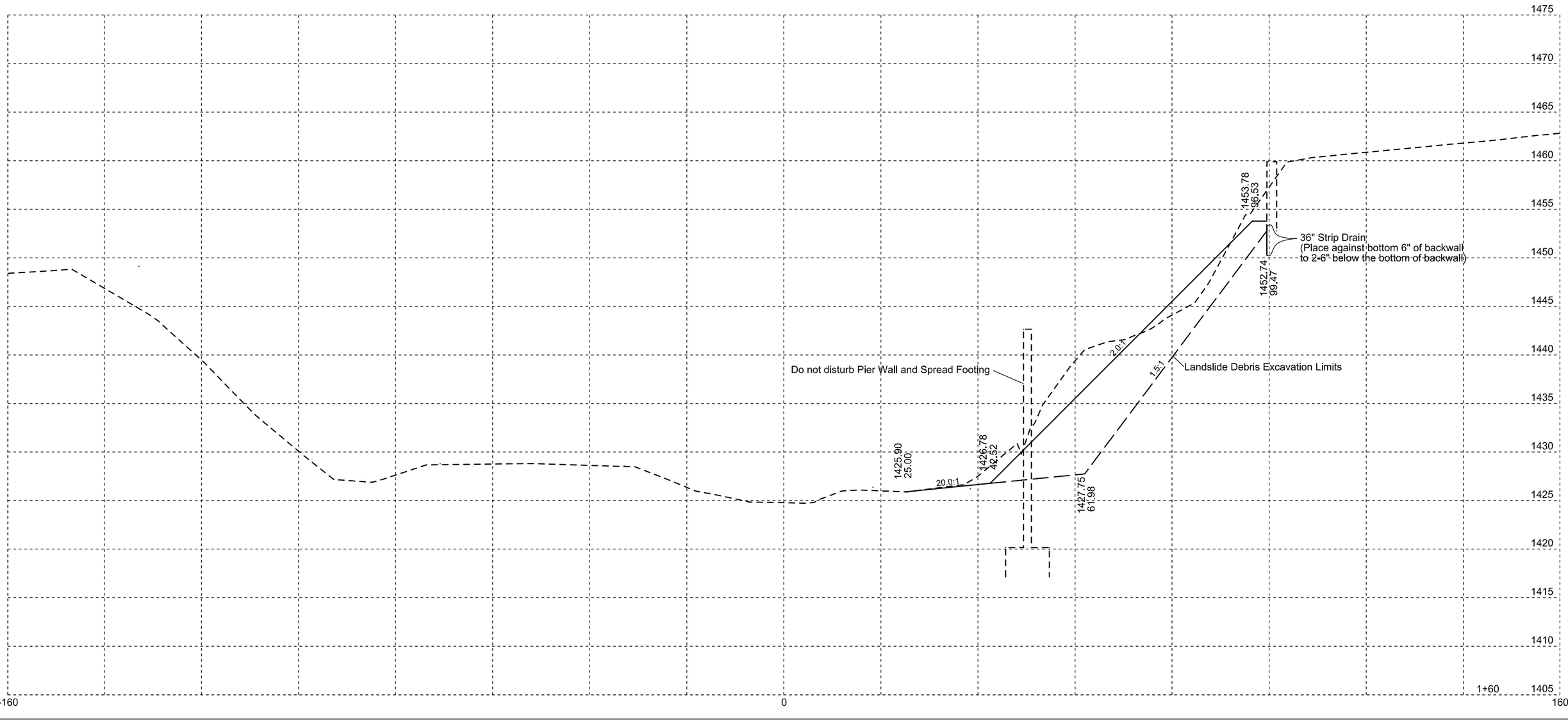
STR. NO. 08-065-095



Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	58	72

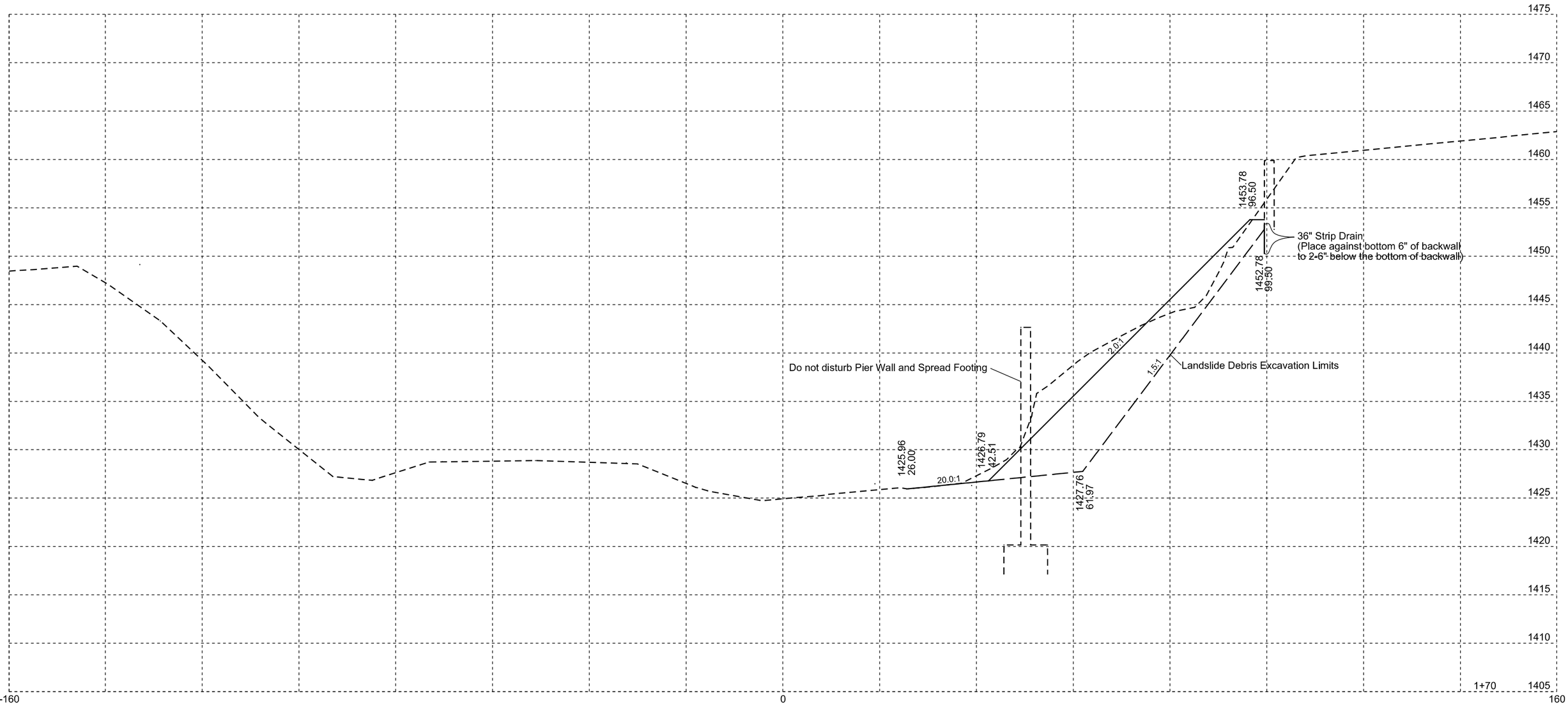
STR. NO. 08-065-095



Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	59	72

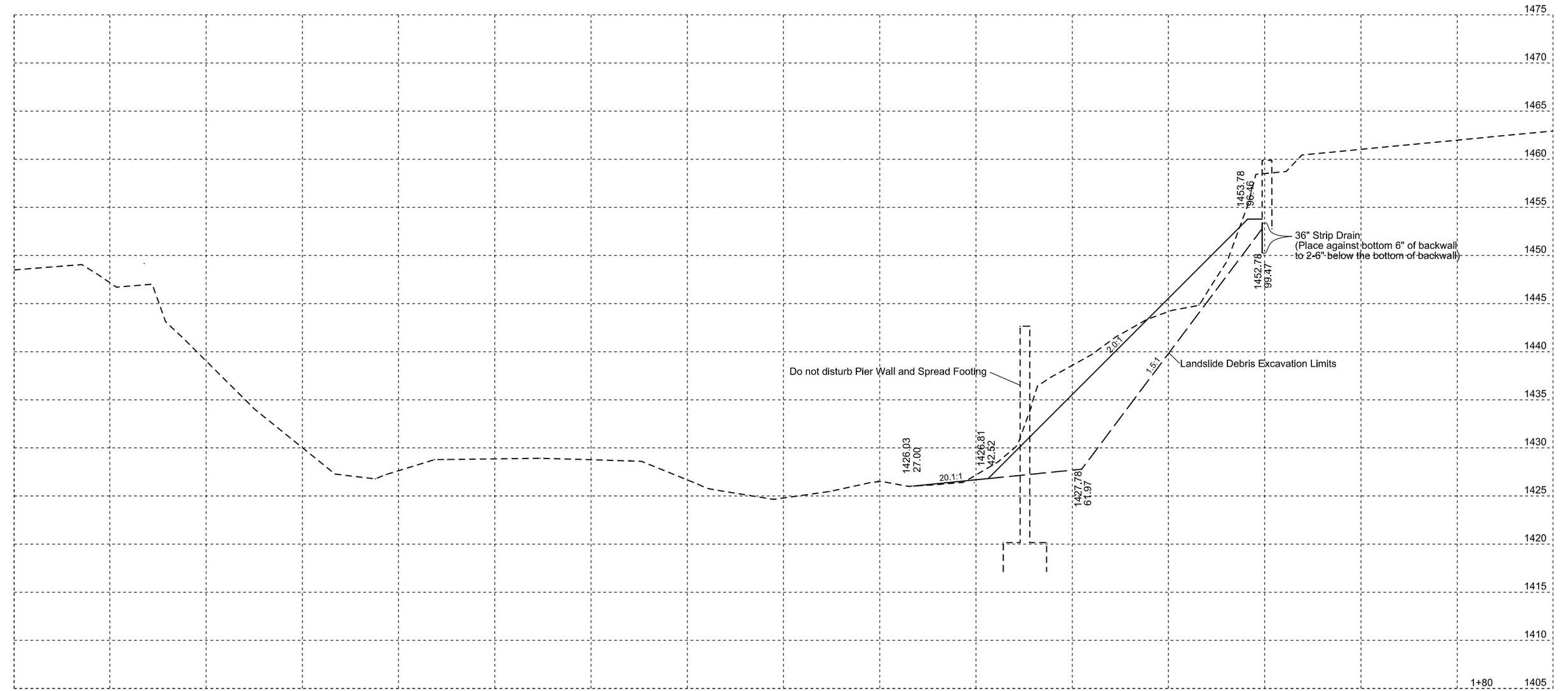
STR. NO. 08-065-095



Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	60	72

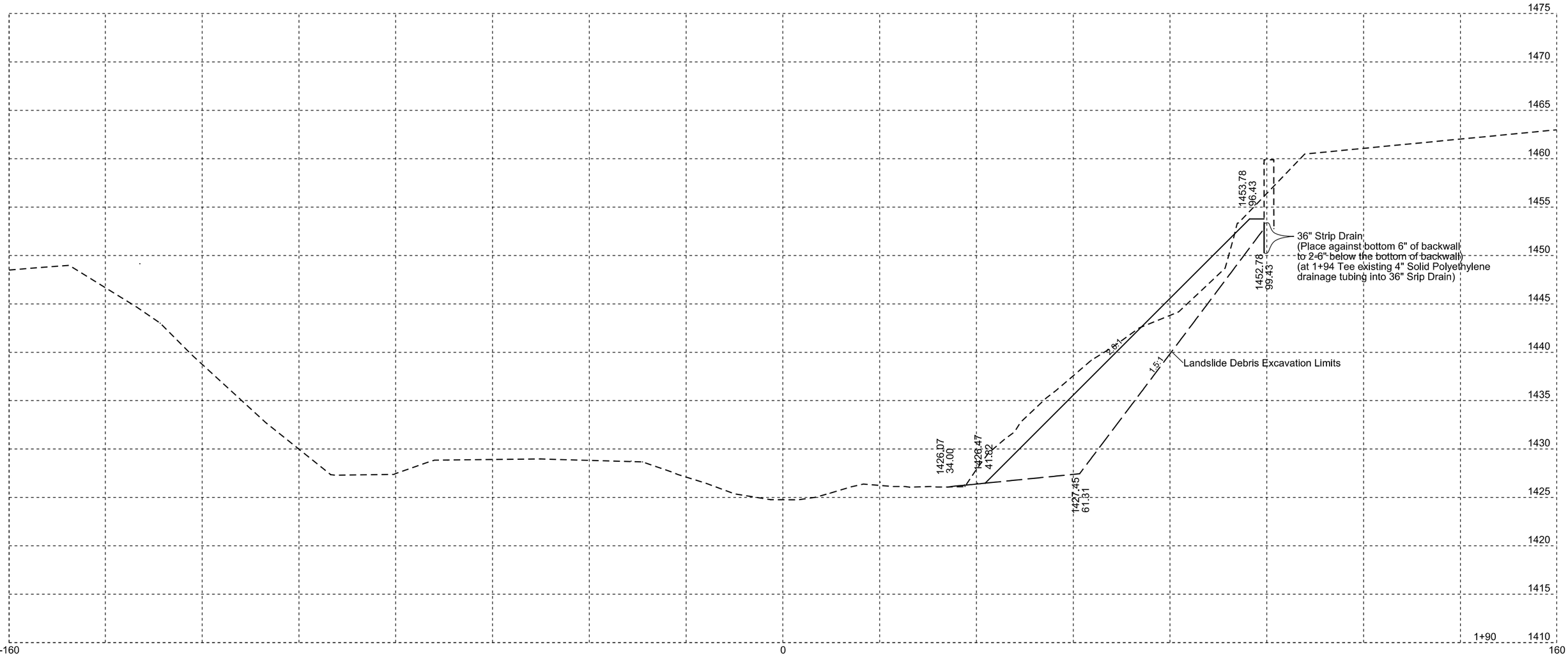
STR. NO. 08-065-095



Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	61	72

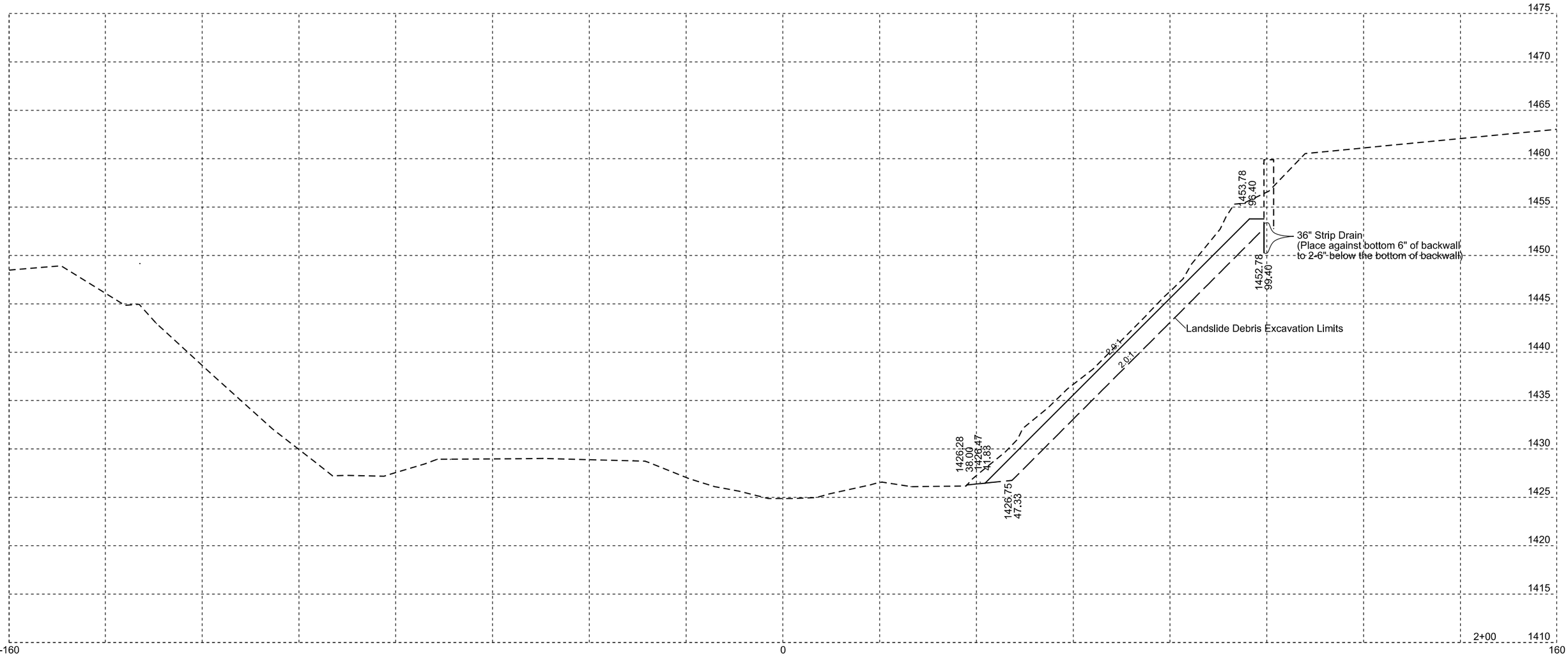
STR. NO. 08-065-095



Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	62	72

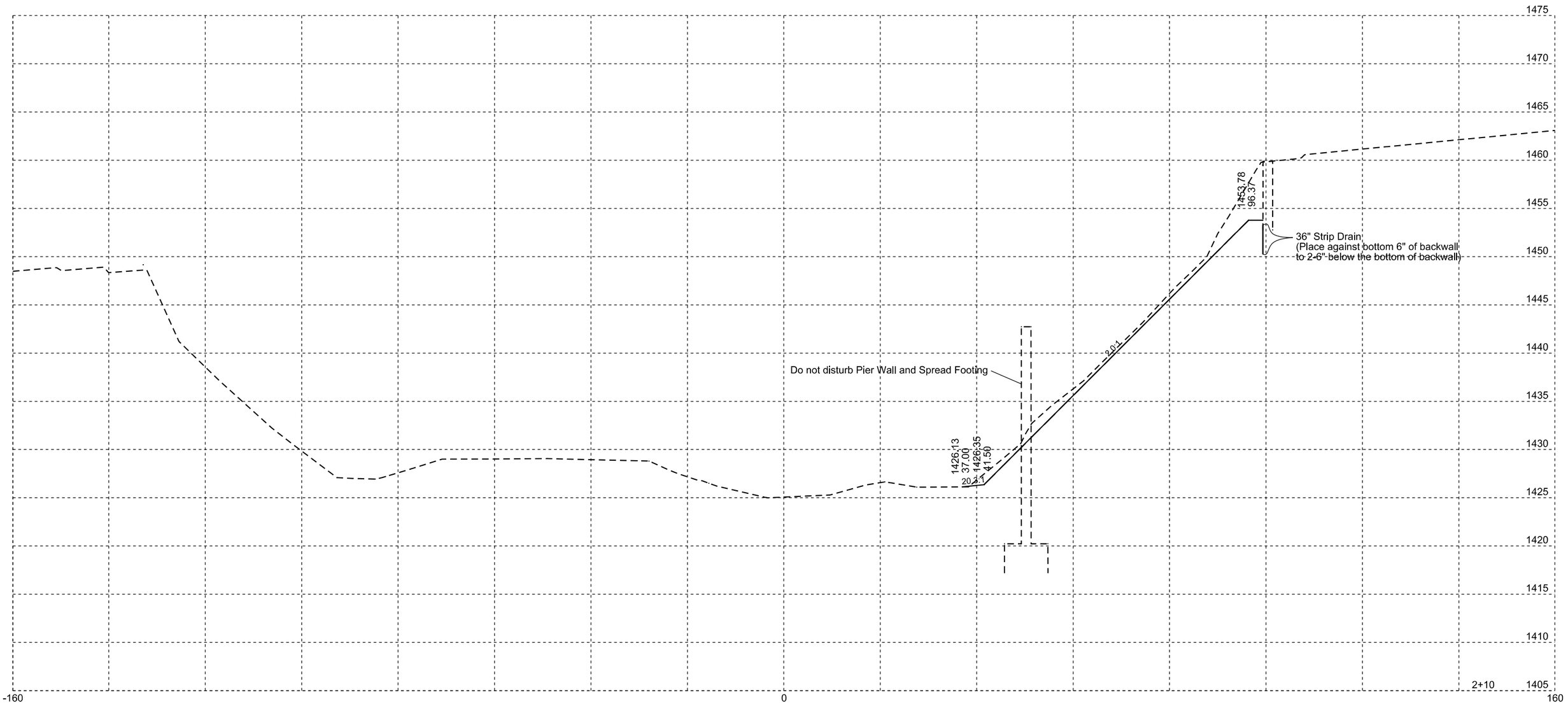
STR. NO. 08-065-095



Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	63	72

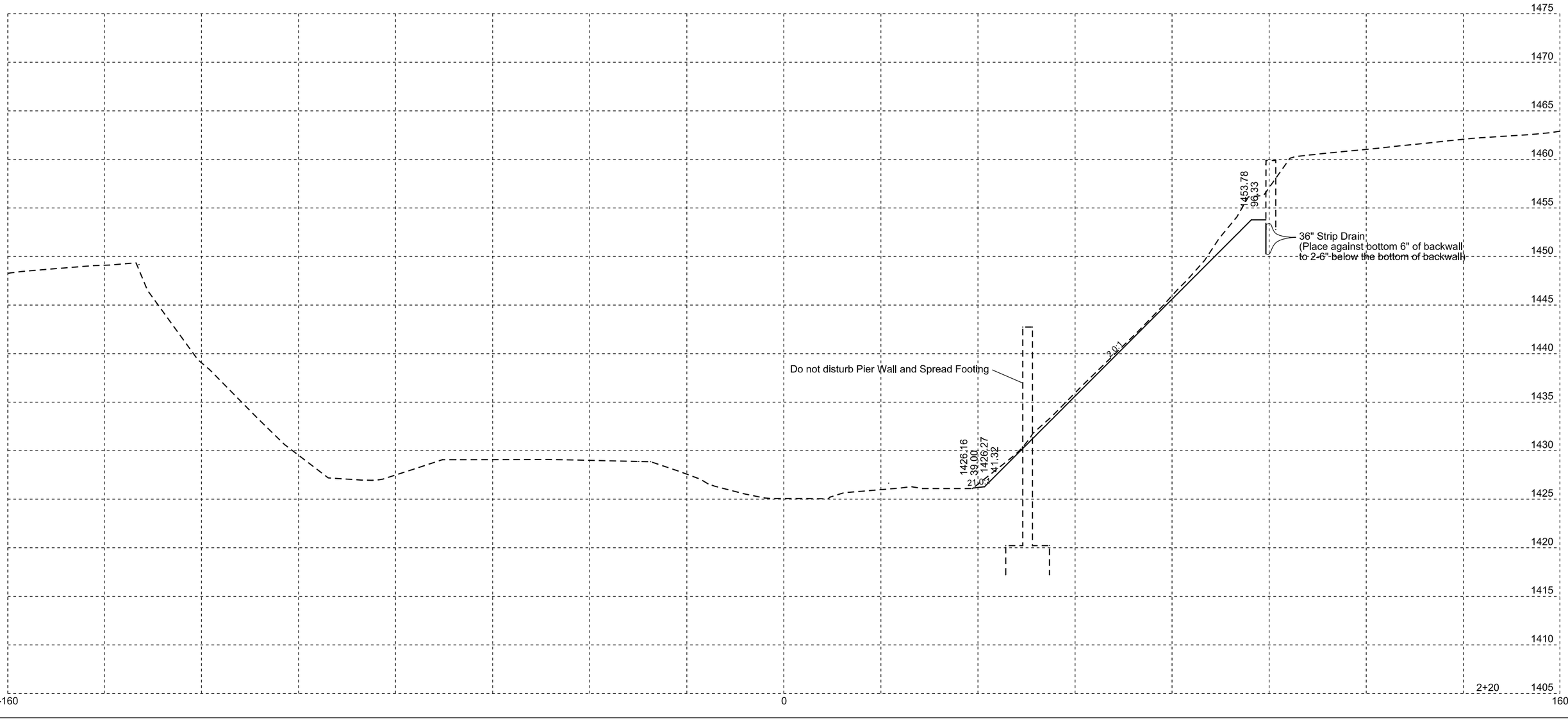
STR. NO. 08-065-095



Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	64	72

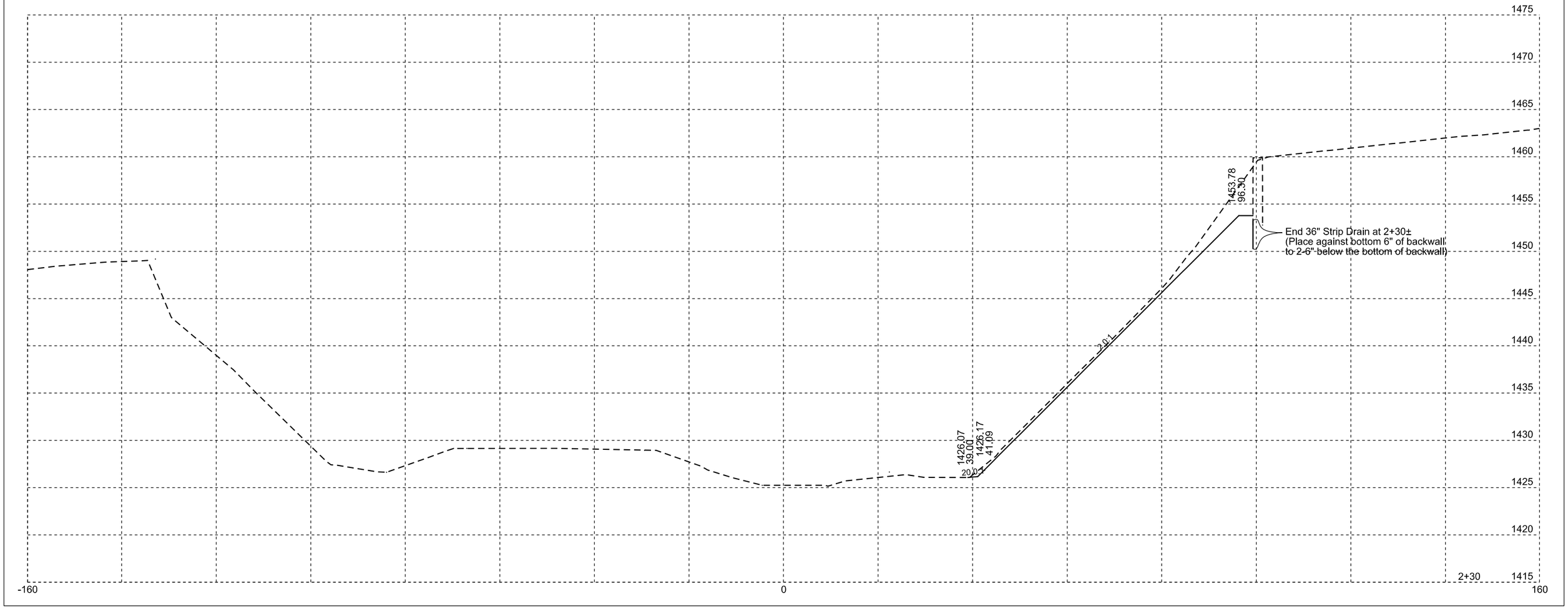
STR. NO. 08-065-095



Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	65	72

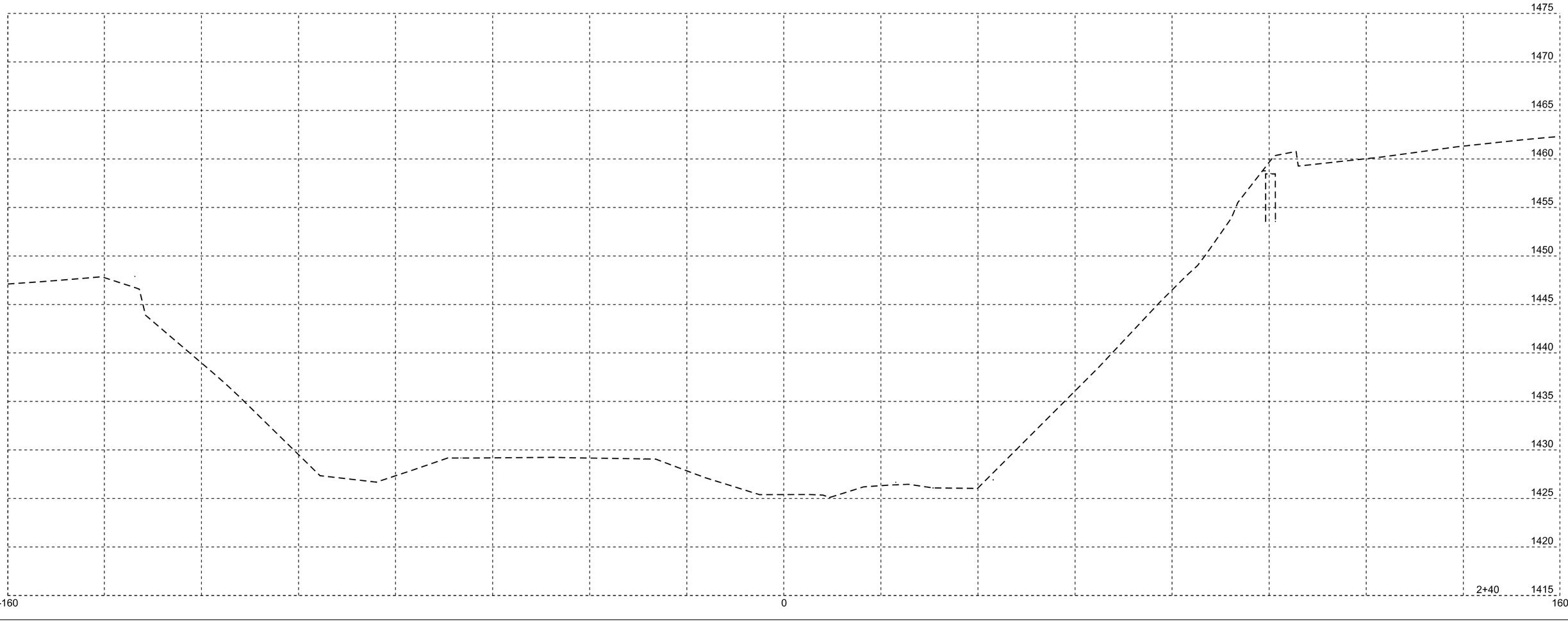
STR. NO. 08-065-095

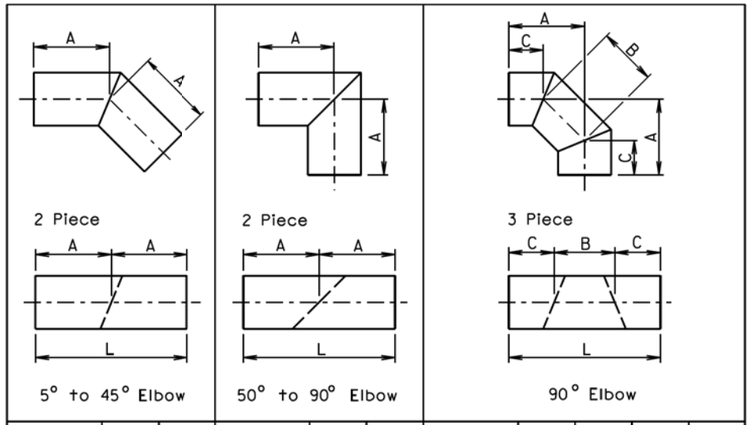


Plotting Date: 06/13/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0905(107)259	66	72

STR. NO. 08-065-095





Diameter	A	L	Diameter	A	L	Diameter	A	B	C	L
Inches	Feet	Feet	Inches	Feet	Feet	Inches	Inches			Feet
12	1	2	12	2	4	12	25½	11	18½	4
15	1	2	15	2	4	15	26½	12	18	4
18	1	2	18	2	4	18	27	14	17	4
21	2	4	21	2	4	21	27	15	16½	4
24	2	4	24	2	4	24	27½	16	16	4
27	2	4	27	2	4	27	27½	17	15½	4
30	2	4	30	3	6	30	40	19	26½	6
33	2	4	33	3	6	33	40	20	26	6
36	2	4	36	3	6	36	40½	21	25½	6
42	2	4	42	3	6	42	41	23	24½	6
48	2	4	48	4	8	48	53½	26	35	8
54	3	6	54	4	8	54	54	28	34	8
60	3	6	60	4	8	60	54½	31	32½	8
66	3	6	66	4	8	66	54	33	31½	8
72	3	6	72	5	10	72	67½	36	42	10
78	3	6	78	5	10	78	68	39	40½	10
84	3	6	84	5	10	84	68½	41	39½	10
90	3	6	90	6	12	90	70	46	37	10
96	3	6	96	6	12	96	82	46	49	12

FABRICATED ELBOW LENGTHS FOR ALL CORRUGATIONS

GENERAL NOTES:

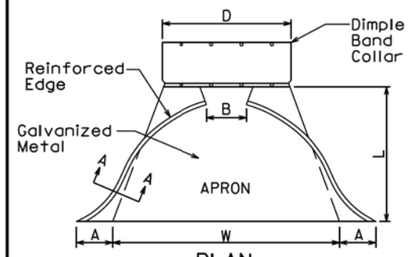
All dimensions shown are nominal.

L = Linear Feet of C.M.P. required to fabricate fitting.

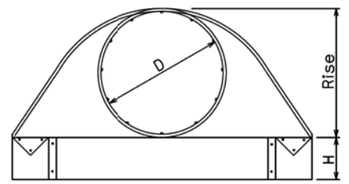
June 26, 2001

Published Date: 2nd Qtr. 2014	SDDOT	C.M.P. FABRICATED LENGTHS FOR ELBOWS	PLATE NUMBER 450.32
			Sheet 1 of 1

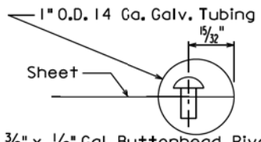
Alternate Type Connector Sections may be used with approval of the Engineer.



PLAN



ELEVATION

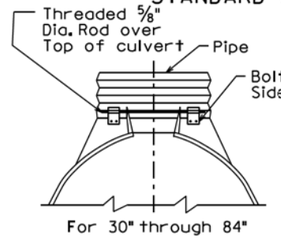


⅜" x ½" Gal. Buttonhead Rivets spaced 6" C. to C. Overall length of rivets=0.78"

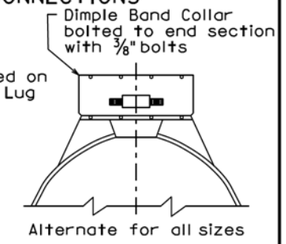
TUBING ATTACHMENT DETAILS SECTION A-A

Dia. D (in.)	Ga.	DIMENSIONS (in.) A	B	H	L	W	Approx. Slope	Body
12	16	6	6	6	21	24	2½:1	1 Pc.
15	16	7	8	6	26	30	2½:1	1 Pc.
18	16	8	10	6	31	36	2½:1	1 Pc.
21	16	9	12	6	36	42	2½:1	1 Pc.
24	16	10	13	6	41	48	2½:1	1 Pc.
30	14	12	16	8	46	60	2½:1	1 Pc.
36	14	14	19	9	51	72	2½:1	2 Pc.
42	12	16	22	11	60	84	2½:1	2 Pc.
48	12	18	27	12	69	90	2¼:1	2 Pc.
54	12	18	30	12	78	102	2:1	3 Pc.
60	12	18	33	12	84	114	1¾:1	3 Pc.
66	12	18	36	12	87	120	1½:1	3 Pc.
72	12	18	39	12	87	126	1⅓:1	3 Pc.
78	12	18	42	12	87	132	1¼:1	3 Pc.
84	12	18	45	12	87	138	1⅙:1	3 Pc.

STANDARD CONNECTIONS

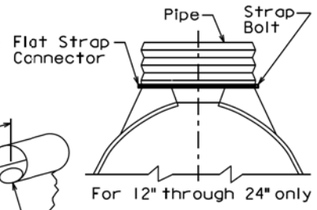


For 30" through 84"

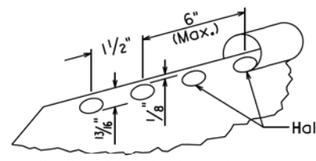


Alternate for all sizes

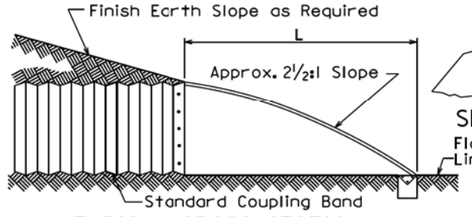
NOTE:
Tubing is slipped over the sheet and rivets or lugs prior to forming operations of the apron.



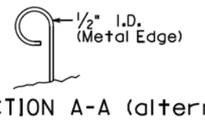
For 12" through 24" only



SECTION A-A (alternate)



TYPICAL CROSS-SECTION



SECTION A-A (alternate)

GENERAL NOTES:

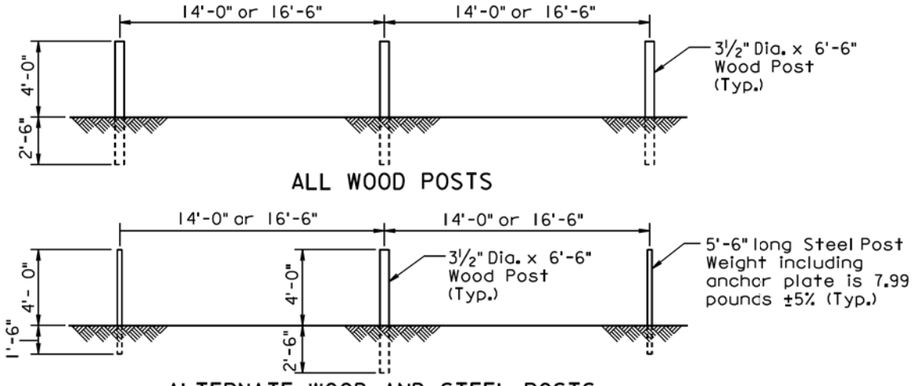
All 3 pc. bodies shall have 12 Ga. sides and 10 Ga. center panels. Width of center panels shall be greater than 20% of the pipe periphery. Multiple panel bodies to have lap seams tightly joined by ⅜" Dia. galvanized rivets or bolts.

For 60" through 84" sizes, reinforced edges shall be supplemented with galvanized stiffener angles. The angles will be 2" x 2" x ¼" for 60" through 72" diameters and 2½" x 2½" x¼" for 78" and 84" diameters. The angles shall be attached by ⅜" diameter galvanized nuts and bolts.

Rivets and Bolts shall be ⅜" Dia. Min. for 10 Ga. and 12 Ga. sheet, and 5/16" Dia. Min. for 14 Ga. and 16 Ga. sheets. Tighten nuts with torque wrench to 25 lbs. torque.

March 31, 2000

Published Date: 2nd Qtr. 2014	SDDOT	C.M.P. FLARED ENDS	PLATE NUMBER 450.35
			Sheet 1 of 1



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

GENERAL NOTES:

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

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

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

September 14, 2009

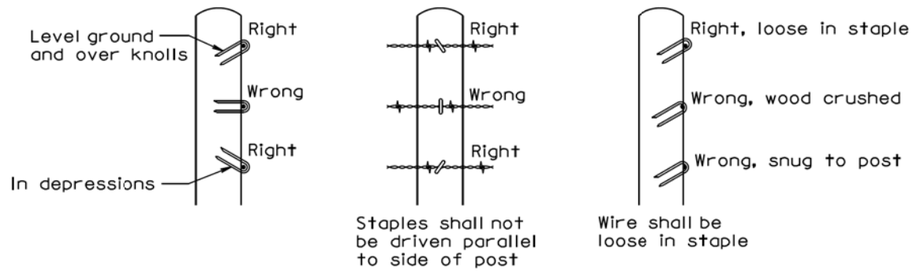
Published Date: 2nd Qtr. 2014

SDDOT

RIGHT-OF-WAY FENCE

PLATE NUMBER 620.01

Sheet 1 of 1



STAPLE INSTALLATION

GENERAL NOTES:

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

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

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

Barbs shall be fabricated from zinc coated 14 ga. wire. Two point barbs shall be wrapped twice around one main strand at 4" spacings and the four point barbs shall be interlocked and wrapped around both main strands at 5" spacings.

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

December 23, 2004

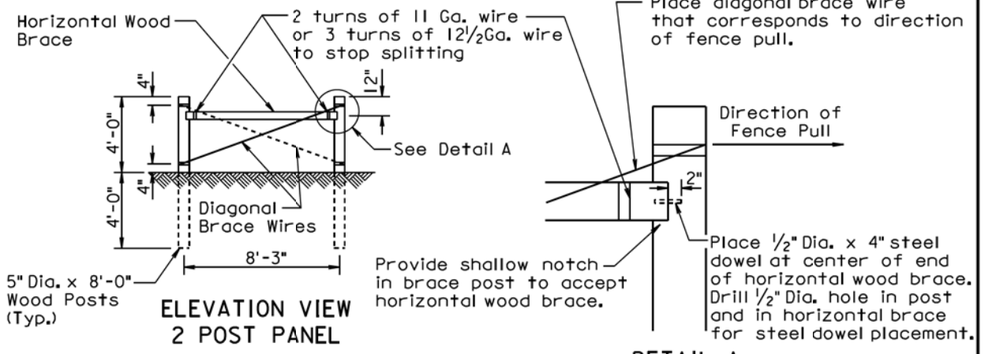
Published Date: 2nd Qtr. 2014

SDDOT

STAPLE INSTALLATION AND GENERAL RIGHT-OF-WAY FENCE NOTES

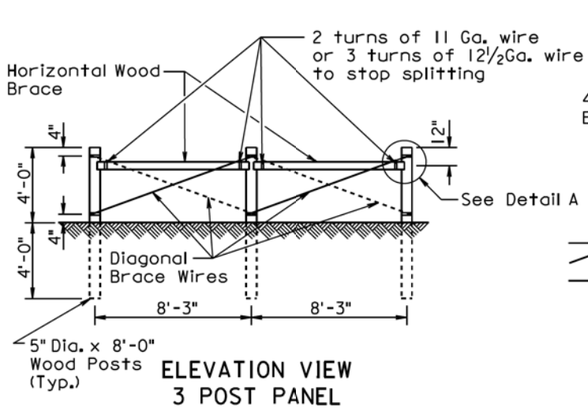
PLATE NUMBER 620.02

Sheet 1 of 1

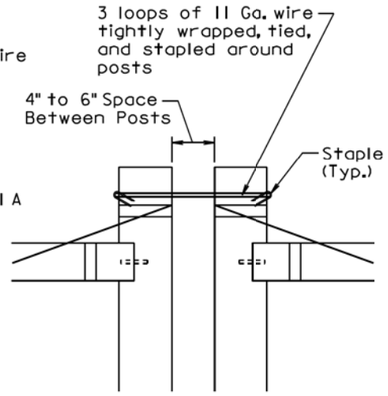


ELEVATION VIEW
2 POST PANEL

DETAIL A



ELEVATION VIEW
3 POST PANEL



DETAIL B

GENERAL NOTES:

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

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

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

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

December 23, 2004

Published Date: 2nd Qtr. 2014	SDDOT	BRACE PANELS AND APPLICATIONS OF BRACE PANELS	PLATE NUMBER 620.03 Sheet 1 of 3

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

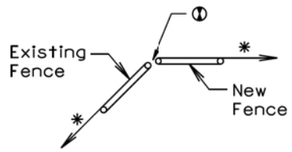
GENERAL NOTE:

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

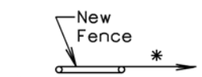
* If fence length is less than 600' to next corner use a 2 post panel.
If fence length is greater than 600' to next corner use a 3 post panel.

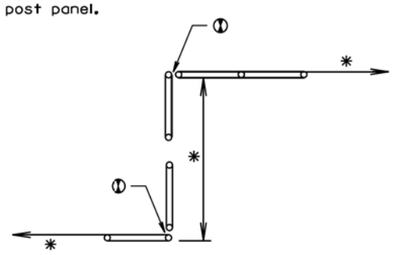
** Fence lengths greater than 1320' and less than 2640' place 2 Post Panel approximately at midpoint.

① See Detail B on Sheet 1 of 3.

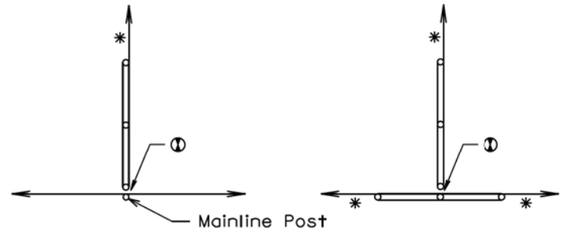


BEGIN OR END FENCE
(where new fence ties into existing fence)

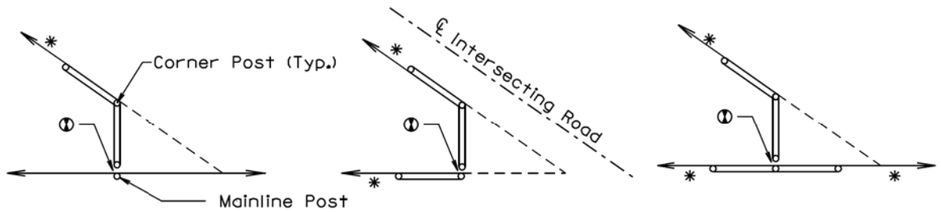




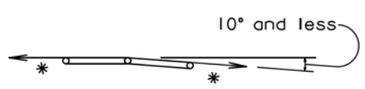
SHORT JOGS IN FENCE



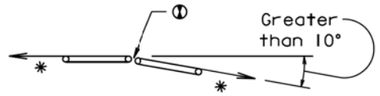
CROSS FENCE



SHARP ANGLES IN CROSS FENCE



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

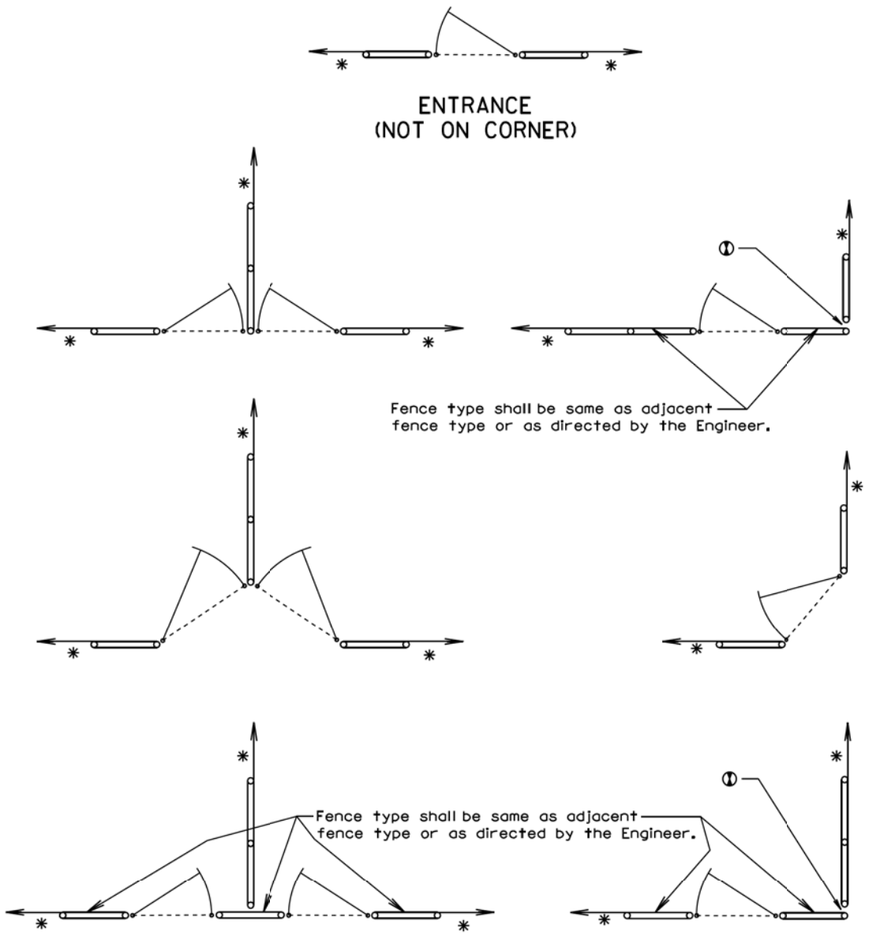


Additional fence panel is required when an angle in the mainline fence is greater than 10°.

ANGLES IN MAINLINE FENCE

December 23, 2004

Published Date: 2nd Qtr. 2014	SDDOT	BRACE PANELS AND APPLICATIONS OF BRACE PANELS	PLATE NUMBER 620.03 Sheet 2 of 3



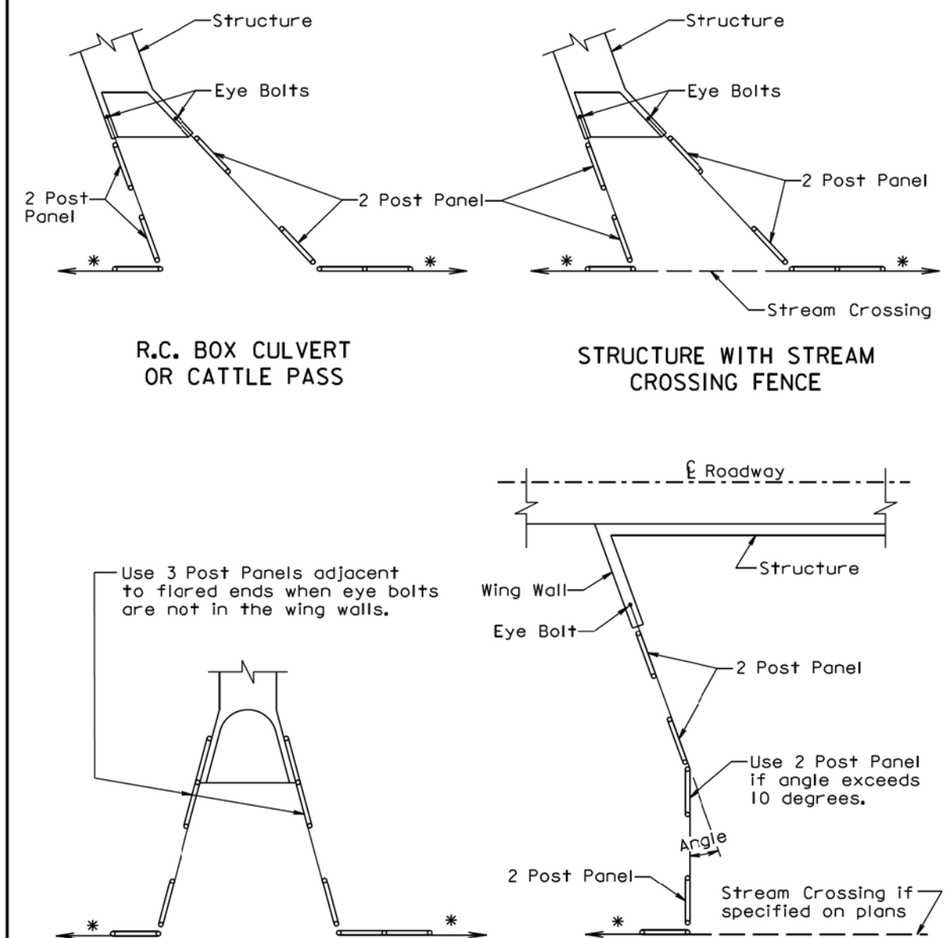
GATES

* If fence length is less than 600' to next corner use a 2 post panel.
If fence length is greater than 600' to next corner use a 3 post panel.

① See Detail B on Sheet 1 of 3.

December 23, 2004

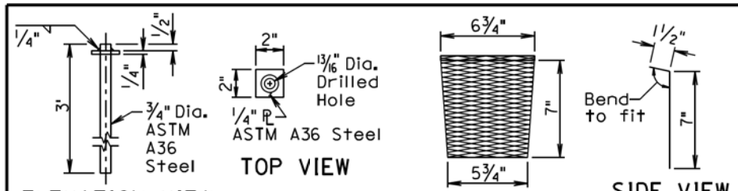
Published Date: 2nd Qtr. 2014	SDDOT	BRACE PANELS AND APPLICATIONS OF BRACE PANELS	PLATE NUMBER 620.03
			Sheet 3 of 3



* If fence length is less than 600' to next corner use a 2 post panel.
If fence length is greater than 600' use a 3 post panel.

December 23, 2010

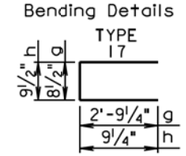
Published Date: 2nd Qtr. 2014	SDDOT	BRACE PANEL APPLICATIONS AT STRUCTURES	PLATE NUMBER 620.04
			Sheet 1 of 1

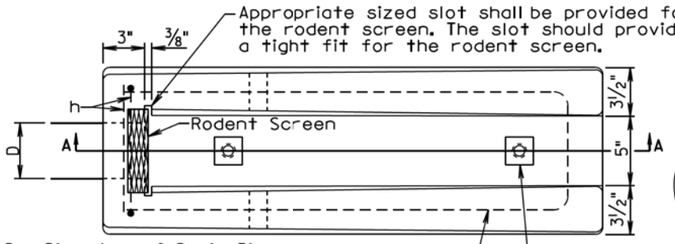


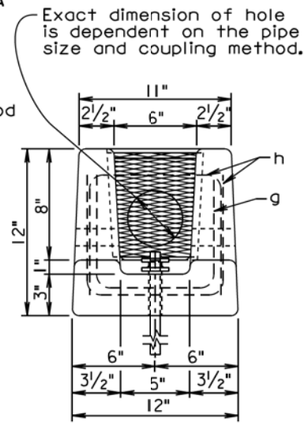
REINFORCING SCHEDULE				
MK.	No.	Size	Length	Type
g	1	4	6'-3"	17
h	2	4	2'-4"	17

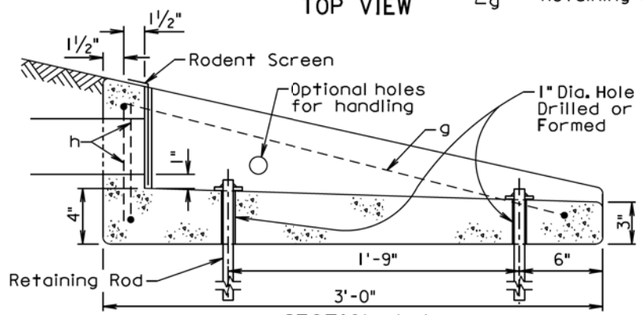
NOTE:
All dimensions are out to out of bars.

Bending Details









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 ½". The size refers to the measurement across the smallest diamond shaped opening measured from the centers of the wires.

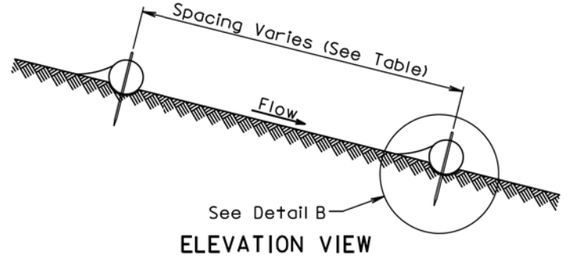
The retaining rod shall be galvanized in accordance with ASTM A123 after all shop welding has been completed.

The drawing indicates using ½" fillets; however, ¾" chamfers may be substituted for the ½" fillets.

All costs for furnishing and installing the concrete headwall including equipment, labor, and materials including concrete, reinforcing steel, retaining rods, and rodent screen shall be incidental to the contract unit price per each for "Precast Concrete Headwall for Drain".

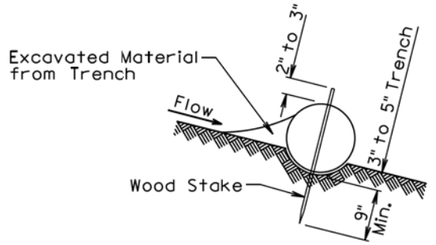
December 23, 2010

Published Date: 2nd Qtr. 2014	SDDOT	PRECAST CONCRETE HEADWALL FOR DRAIN	PLATE NUMBER 680.03
			Sheet 1 of 1

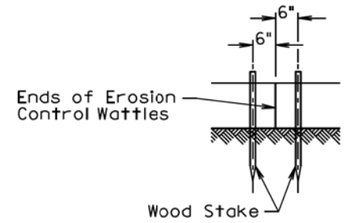


ELEVATION VIEW
CUT OR FILL SLOPE INSTALLATION

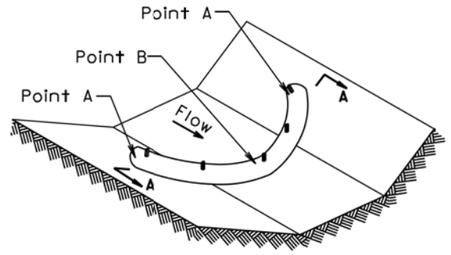
CUT OR FILL SLOPE INSTALLATION	
Slope	Spacing (Ft)
1:1	10
2:1	20
3:1	30
4:1	40



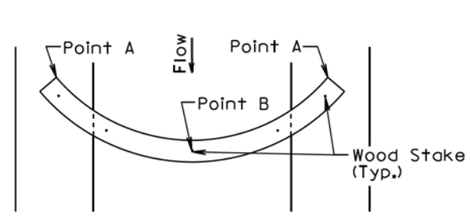
DETAIL B
(TYPICAL OF ALL INSTALLATIONS)



DETAIL C

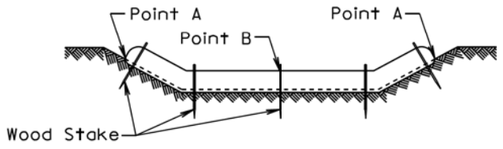


ISOMETRIC VIEW
DITCH INSTALLATION



PLAN VIEW
DITCH INSTALLATION

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



SECTION A-A

December 23, 2004

Published Date: 2nd Qtr. 2014	SDDOT	EROSION CONTROL WATTLE	PLATE NUMBER 734.06
			Sheet 1 of 2

GENERAL NOTES:

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

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

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

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

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

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

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

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

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

December 23, 2004

Published Date: 2nd Qtr. 2014	SDDOT	EROSION CONTROL WATTLE	PLATE NUMBER 734.06
			Sheet 2 of 2