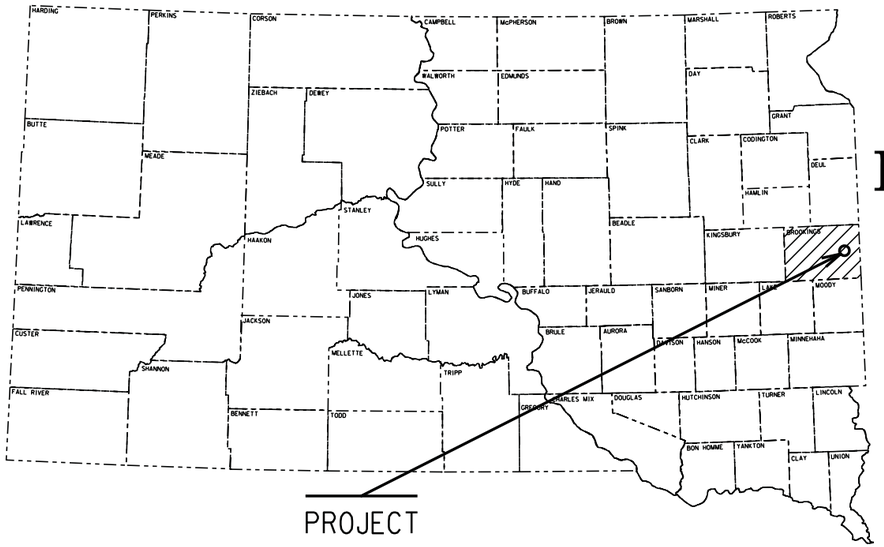
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	PH 0014(211)427	1	60

Plotting Date: 03/19/2015

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

PROJECT PH 0014(211)427
U.S. HIGHWAY 14
BROOKINGS COUNTY

PCC PAVEMENT WIDENING
& ROW PLANS
PCN 04GN



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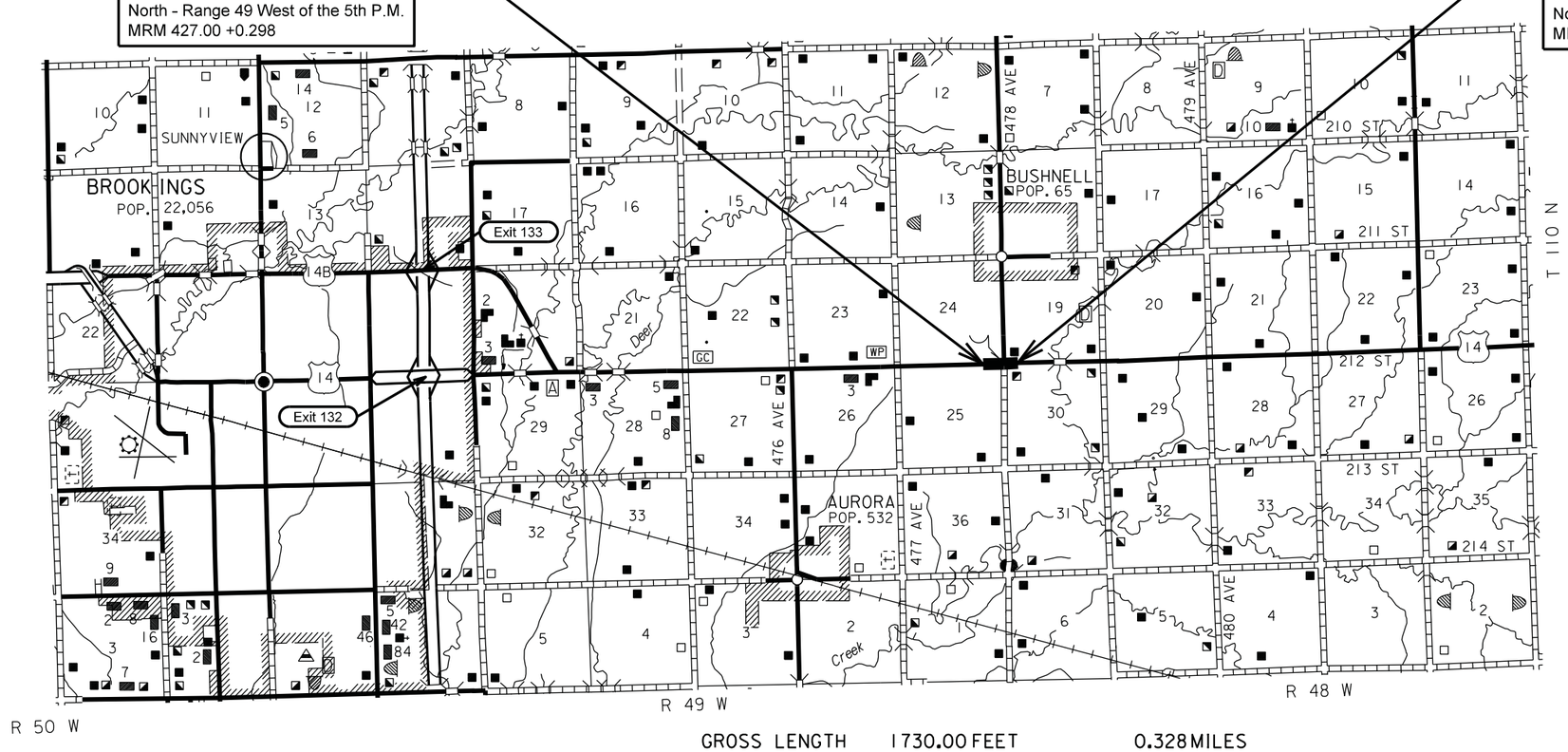
Begin Project
Sta 159+00.00
1042' West of the SE Corner
of Section 24 - Township 110
North - Range 49 West of the 5th P.M.
MRM 427.00 +0.298

End Project
Sta 176+30.00
688' East of the SW Corner
of Section 19 - Township 110
North - Range 48 West of the 5th P.M.
MRM 427.00 +0.625



GROSS LENGTH	1730.00 FEET	0.328 MILES
LENGTH OF EXCEPTIONS	0.00 FEET	0.000 MILES
NET LENGTH	1730.00 FEET	0.328 MILES

SCALES

PLAN		1"=40'
PROFILE.	HORIZONTAL:	1"=40'
	VERTICAL:	1"=10'
CROSS SECTIONS	HORIZONTAL:	1"=20'
	VERTICAL:	1"=10'

DESIGN DESIGNATION

ADT (2013)	2327
ADT (2033)	3079
DHV	379.2
D	51%
T DHV	5.8%
T ADT	12.7%
V	70 M.P.H.

STORM WATER PERMIT

Major Stream: Medary Creek
Project Area: 6 Acres
Area Disturbed: 2.5 Acres
Begin Lat/Lon: 44.31112, -96.95107

1

PLOT SCALE - 1:7200
PLOT NAME - 1
FILE - ...\DESIGN\04GN_TITLE SHEET.DGN
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ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

Estimate of Quantities

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
110E0510	Remove Pipe End Section	4	Each
110E0600	Remove Fence	150	Ft
110E1100	Remove Concrete Pavement	768.9	SqYd
110E1400	Remove Pavement Marking, 4" or Equivalent	4,100	Ft
110E1690	Remove Sediment	1.0	CuYd
110E1693	Remove Erosion Control Wattle	25	Ft
120E0010	Unclassified Excavation	5,019	CuYd
120E0600	Contractor Furnished Borrow	2,495	CuYd
120E2000	Undercutting	4,704	CuYd
230E0010	Placing Topsoil	315	CuYd
260E1010	Base Course	950.0	Ton
260E1030	Base Course, Salvaged	1,860.0	Ton
270E0040	Salvage and Stockpile Asphalt Mix and Granular Base Material	2,075.0	Ton
320E1200	Asphalt Concrete Composite	643.0	Ton
320E5010	Saw and Seal Shoulder Joint	3,460	Ft
380E0050	8" Nonreinforced PCC Pavement	2,555.6	SqYd
380E6000	Dowel Bar	800	Each
380E6110	Insert Steel Bar in PCC Pavement	1,394	Each
450E4769	24" CMP 16 Gauge, Furnish	52	Ft
450E4770	24" CMP, Install	52	Ft
450E5410	24" CMP Safety End, Furnish	4	Each
450E5411	24" CMP Safety End, Install	4	Each
450E8900	Cleanout Pipe Culvert	1	Each
620E0060	Type 6 Right-of-Way Fence	115	Ft
620E0510	Type 1 Temporary Fence	125	Ft
620E1020	2 Post Panel	4	Each
632E1320	2.0"x2.0" Perforated Tube Post	22.0	Ft
632E2022	4"x4" White Delineator Back to Back with 1.12 Lb/Ft Post	7	Each
632E2028	4" Tubular White Delineator with 1.12 Lb/Ft Post	8	Each
632E3205	Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity	11.2	SqFt
632E3520	Remove, Salvage, Relocate, and Reset Traffic Sign	9	Each
633E0030	Cold Applied Plastic Pavement Marking, 24"	280	Ft
633E0040	Cold Applied Plastic Pavement Marking, Arrow	5	Each
633E1300	Pavement Marking Paint, White	23.0	Gal
633E1305	Pavement Marking Paint, Yellow	23.0	Gal
633E5015	Grooving for Cold Applied Plastic Pavement Marking, 24"	280	Ft
633E5025	Grooving for Cold Applied Plastic Pavement Marking, Arrow	5	Each
634E0010	Flagging	325	Hour
634E0100	Traffic Control	1,638	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
730E0204	Type C Permanent Seed Mixture	27	Lb
732E0100	Mulching	5.0	Ton
734E0154	12" Diameter Erosion Control Wattle	100	Ft
734E0165	Remove and Reset Erosion Control Wattle	25	Ft
900E0010	Refurbish Single Mailbox	1	Each

SPECIFICATIONS

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

ENVIRONMENTAL COMMITMENTS

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

COMMITMENT B: FEDERALLY THREATENED, ENDANGERED, AND PROTECTED SPECIES

COMMITMENT 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.

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

Action Taken/Required:

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

COMMITMENT E: STORM WATER

Construction activities constitute 1 acre or more of earth disturbance.

Action Taken/Required:

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

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

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

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

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

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

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

Contractor Certification Form:

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

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

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

ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

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.

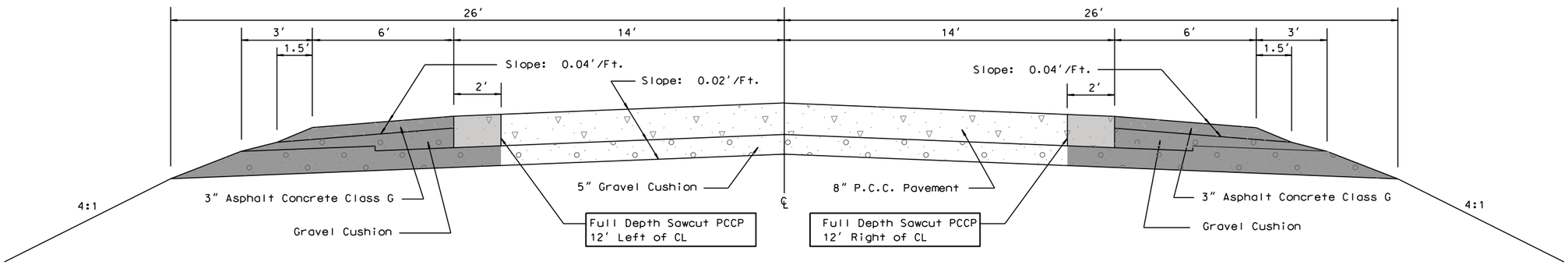
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	PH 0014(211)427	4	60

Plotting Date: 03/19/2015

TYPICAL IN PLACE & REMOVAL SECTIONS

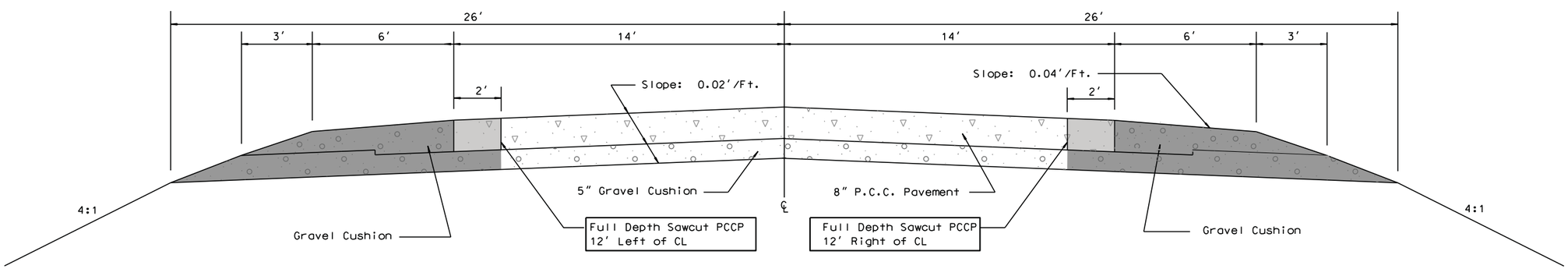
MAINLINE

Station 159+00 to Station 169+91.50



MAINLINE

Station 169+91.5 to Station 176+30



Remove 8″ P.C.C. Pavement

Salvage and Stockpile Asphalt Mix and Granular Base Material

Sufficient Gravel Cushion material shall remain in place to allow for trimming prior to placing new P.C.C. Pavement.

PLOT SCALE - 1:5
PLOT NAME - 2
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STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	PH 0014(211)427	5	60

Plotting Date: 03/19/2015

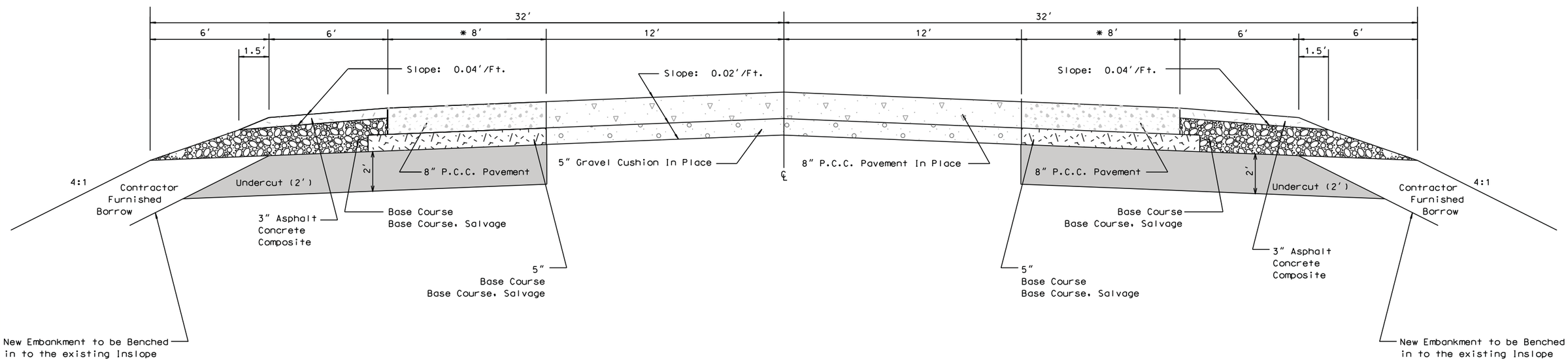
TYPICAL WIDENING SECTION

Transitions:

* Sta 159+00 to 162+90 - 2' to 8'
* Sta 172+40 to 176+30 - 8' to 2'

MAINLINE

Station 159+00 to Station 176+30



PLOT SCALE - 1:5
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PLOT NAME - 3
FILE - ....\04GN TYPICAL SECTIONS.DGN

RATES OF MATERIALS

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

STA. 162+90 to 172+40

Base Course, Salvaged or Base Course beneath P.C.C. Pavement (Rate per one shoulder)

Salvaged Material or Crushed Aggregate 27 tons

STA. 159+00 to 176+30

Base Course, Salvaged or Base Course beyond P.C.C. Pavement (Rate per one shoulder)

Salvaged Material or Crushed Aggregate 50 tons

Asphalt Concrete Composite (Rate per one shoulder)

Asphalt Concrete Composite 12.5 tons

TABLE OF ADDITIONAL QUANTITIES

Item/Location	Base Course, Salvaged or Base Course (Ton)	Asphalt Concrete Composite (Ton)
Base Course beneath P.C.C.P. in width transition areas	290	
Intersecting Road Lt	200	175 (4”)
Intersecting Road Rt	50	35 (3”)
Farm Ent Sta 174+29 Rt	25	
Total	**565**	**210**

The above quantities are included in the Estimate of Quantities.

SURFACING THICKNESS DIMENSIONS

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

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

SEQUENCE OF OPERATIONS

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

The intersecting county/township roads and the farm entrance at Sta 174+49 can be closed to accommodate construction. These roads/entrances can be closed beginning 24 hours prior to placement of P.C.C. PAVEMENT and may remain closed until such time as the P.C.C. PAVEMENT has obtained a compressive strength of 4000 psi.

Work shall be limited to one side of the roadway at any given time. The Contractor shall not be required to complete all work on one side of the roadway prior to beginning work on the other side of the roadway, however, once P.C.C. Pavement removal operations begin on one side of the roadway, no work will be allowed on the other side of the roadway until such time as the new P.C.C. Pavement has obtained a compressive strength of 4000 psi.

1. Install construction signing.
2. Remove topsoil.
3. Saw cut and remove P.C.C. Pavement, and salvage and stockpile asphalt mix and granular base material.
4. Install erosion control measures.
5. Complete undercut.
6. Place contractor furnished borrow.
7. Place base course and/or base course, salvaged material.
8. Place P.C.C. Pavement.
9. Place remainder of base course.
10. Repeats steps 2 through 9 for the other side of the roadway.
11. Place asphalt concrete.
12. Install permanent pavement markings.
13. Restore topsoil to disturbed areas.
14. Reseed disturbed areas.
15. Reset any disturbed permanent signing.

A pavement drop-off in excess of 8” will not be permitted over a weekend, during a holiday, or for any other break in work activities exceeding 48 hours.

Once work starts work shall proceed in a continuous manor until the work is completed. Leaving the project will not be permitted unless authorized by the Engineer.

TRAFFIC CONTROL

One lane of traffic shall be maintained at all times. During non-working hours, one lane of traffic in both directions shall be maintained.

Removing, relocating, covering, salvaging and resetting of existing traffic control devices, including delineation, shall be the responsibility of the Contractor. Cost of this work shall be incidental to the various contract items unless otherwise specified in the plans. 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 as near the right-of-way line as possible. Contractor’s employees should mobilize at a location off the right-of-way and arrive at the work sites in a minimum number of vehicles necessary to perform the work. Indiscriminate driving and parking of vehicles within the right-of-way will not be permitted. Any damage 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.

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

Traffic approaching the project from intersecting roadways, streets, and approaches must be adequately accommodated. Major intersections or large commercial entrances may require additional signing, flaggers, and channelizing devices on a temporary basis until work activities pass these areas.

Shoulder Drop Off signs (W8-17) and Shoulder Drop-Off plaques (W8-17P) shall be placed at each end of the project any time there is a shoulder drop off of 3” or greater. These signs are included in the Traffic Control Devices Inventory sheet.

During nonworking hours, signing as depicted on Standard Plate 634.03 shall be displayed. If the shoulder drop off is 3” or greater, the spacing of the channelizing devices shall be 50’ maximum.

A 6’ wide Type III Barricade shall be placed on the shoulder at the beginning of the work space and at the far side of the intersecting road.

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

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

Traffic Control units, as shown in the Estimate of Quantities, are estimates. Contractor’s operation may require adjustments in quantities, either more or less. Payment will be for those signs actually ordered by the Engineer and used.

Channelizing Devices, Drums and/or Type II Barricades shall be maintained to a minimum height of 3’ above the surface which is being used to maintain traffic.

PLACING TOPSOIL

A 4” depth of topsoil shall be salvaged and stockpiled prior to beginning constructing. The topsoil shall be bladed down the respective inslope and left in a windrow if at all possible. Following completion of construction, topsoil shall be spread evenly over the disturbed areas.

The estimated amount of topsoil to be removed and replaced is 315 CuYd. Placing topsoil shall not be measured for payment with basis of payment being plans quantity.

CONTRACTOR FURNISHED BORROW

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

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

GRADING OPERATIONS

Water for Embankment is estimated at the rate of 10 gallons of water per cubic yard of Embankment minus Waste. No separate payment will be made for the Water for Embankment and all costs associated shall be incidental to the contract unit price per cubic yard of CONTRACTOR FURNISHED BORROW.

Temporary fence and/or permanent fence shall be placed ahead of the grading operation unless otherwise directed by the Engineer.

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

Additional excavation will be required to ensure positive drainage into and out of extended culverts. Excavated material shall be incorporated into the approach slope embankment. The ditches shall be excavated for a minimum distance of 100’ from the ends of the extended culvert.

Compaction of earth embankment shall be governed by the Specified Density Method.

UTILITIES

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

SHRINKAGE FACTOR: Embankment +50%

TABLE OF UNCLASSIFIED EXCAVATION

Undercut		4704
Topsoil		315
	Total	5019

BRACE PANELS FOR ROW FENCE

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

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

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

TABLE OF FENCING

LOCATION	QUANTITY	
	Type 6 Fence	2 Post Panels
169+75 –166'L to Sta. 170+25 – 66'L	115'	4

UNDERCUTTING

After the existing surfacing is removed in the shoulder widening area, the existing embankment will be undercut in a manner that allows for 2 feet of new embankment to be constructed below the finished subgrade top. The remaining new embankment will be benched in to the existing inslope as per Section 120.3 B.1. of the Specifications.

The undercut material or other suitable material, as directed by the Engineer, shall then be replaced and compacted to the density specified for the section being constructed.

The plan shown quantity will be the basis of payment. However, if there are additional areas of undercut other than what is shown in the plans, the Engineer shall direct removal of these areas and the additional areas will be measured according to the Engineer.

TABLE OF UNDERCUTTING

Station	to	Station	Quantity (CuYd)
159+00 L		176+30 L	2352
159+10 R		176+30 R	2352
		Total:	4704

CORRUGATED METAL PIPE

Corrugated metal pipes shall have 2 ⅔-inch X ½-inch corrugations for 42-inch and smaller round pipe and 48-inch and smaller arch pipe unless otherwise stated in the plans. Corrugated metal pipes shall have 3-inch X 1-inch or 5-inch X 1-inch corrugations for 48-inch and larger round pipe and 54-inch and larger arch pipe unless otherwise stated in the plans.

All pipe and safety ends designated for removal shall become the property of the Contractor for his disposal.

It may be necessary to remove a short section of CMP barrel section in order to extend the existing culverts or properly place the new end culvert end treatment. When necessary to remove end sections of CMP culverts, they may be cut with a torch. If the culvert is cut the damaged area shall be painted with a galvanizing paint approved by the Engineer. All costs associated with cutting and painting shall be incidental to the contract unit price per foot for REMOVE PIPE END SECTION.

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

CLEANOUT PIPE CULVERT

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

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

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

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

SALVAGE AND STOCKPILE ASPHALT MIX AND GRANULAR BASE MATERIAL

An estimated 1940 tons (1030 Cubic Yards) of asphalt mix and granular base material shall be salvaged from the entire length of the existing highway shoulders and stockpiled at a site furnished by the Contractor and satisfactory to the Engineer. An additional estimated 135 tons of asphalt mix and granular base material shall be salvaged from the intersecting section line roadways.

Rev. 4-23-15 SLS

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

It is estimated that there are 30 cubic yards of salvageable material per station per shoulder. The rate of salvageable material is based on a 13.5 foot width.

BASE COURSE, SALVAGED

Base Course, Salvaged shall be obtained from the salvaged shoulder materials produced on this project and may be used without further gradation testing.

All other requirements of the specifications for Base Course, Salvaged shall apply.

All Base Course, Salvaged material shall be utilized. It is assumed that there will be a 10% loss of material during the stockpiling and handling process, therefore the quantity of Base Course, Salvaged indicated in the plans is 1860 tons.

WATER FOR COMPACTION OF GRANULAR MATERIALS

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

REMOVAL OF EXISTING PCC PAVEMENT

The existing pavement is 8" Plain Jointed P.C.C. Pavement The existing transverse contraction joints are spaced at 20 feet. The aggregate in the existing Plain Jointed P.C.C. Pavement may be quartzite.

TABLE OF CONCRETE PAVEMENT REMOVAL

Location	SqYd
Sta 159+00 to 176+30 Lt	384.4
Sta 159+00 to 176+30 Lt	384.4
Total	768.8

SAWING IN EXISTING SURFACING

Where new Portland Cement Concrete Pavement (PCCP) or new asphalt concrete is placed adjacent to existing asphalt concrete or PCCP, the existing pavement shall be sawed full depth to a true line with a vertical face. This shall require that the in place P.C.C. Pavement shall be saw cut for the entire length of the project on both sides of the roadway. No separate payment shall be made for sawing. Cost of sawing shall be considered incidental to the contract unit price for 8" NONREINFORCED PCC PAVEMENT.

STEEL BAR INSERTION

The Contractor shall insert the Steel Bars (1 ¼" x 18 inch epoxy coated plain round dowel bars and no. 5 epoxy coated deformed tie bars) into drilled holes in the existing concrete pavement. An epoxy resin adhesive must be used to anchor the steel bar in the drilled hole.

The steel bars shall be cut to the specified length by sawing or shearing and shall be free from burring or other deformations.

Epoxy resin adhesive shall be of the type intended for horizontal applications, and shall conform to the requirements of ASTM C 881, Type IV, Grade 3 (equivalent to AASHTO M235, Type IV, Grade 3).

The diameter of the drilled holes in the existing concrete pavement for the steel bars shall not be less than 1/8 inch nor more than 3/8 inch greater than the overall diameter of the steel bar. Holes drilled into the existing concrete pavement shall be located at mid-depth of the slab and true and normal. The drilled holes shall be blown out with compressed air using a device that will reach to the back of the hole to ensure that all debris or loose material has been removed prior to epoxy injection.

Mix the epoxy resin as recommended by the manufacturer and apply by an injection method approved by the Engineer. If an epoxy pump is utilized, it shall be capable of metering the components at the manufacturer's designated rate and be equipped with an automatic shut-off. The pump shall shut off when any of the components are not being metered at the designated rate. Fill the drilled holes 1/3 to 1/2 full of epoxy, or as recommended by the manufacturer, prior to insertion of the steel bar. Care shall be taken to prevent epoxy from running out of the horizontal holes prior to steel bar insertion. Rotate the steel bar during insertion to eliminate voids and ensure complete bonding of the bar. Insertion of the bars by the dipping method will not be allowed.

Cost for the epoxy resin adhesive, steel bars, drilling of holes, applying the adhesive, inserting the steel bars into the drilled holes and all other items incidental to the insertion of the steel bars shall be incidental to the contract unit price per each for INSERT STEEL BAR IN PCC PAVEMENT.

Epoxy coated plain round steel bars shall be inserted on 12 inch centers in the transverse joint. The first steel bar shall be placed a minimum of 3 inches and a maximum of 6 inches from the outside edge of the slab.

Epoxy coated deformed No. 5 steel bars shall be inserted on 30 inch centers in the longitudinal joint and shall be placed a minimum of 15 inches from the existing transverse contraction joint.

TABLE OF STEEL BAR INSERTION

LOCATION	QUANTITY OF BARS	
	No 5 Deformed	1 ¼" Smooth
Sta. 159+00 Lt.		2
Sta. 159+00 Rt.		2
Sta. 159+00 to 176+30 Lt.	693	
Sta. 159+00 to 176+30 Rt.	693	
Sta. 176+30 Lt.		2
Sta. 176+30 Rt.		2
Totals:	1,386	8

8" NONREINFORCED PCC PAVEMENT

The aggregate may require screening as determined by the Engineer.

The concrete used in the Portland Cement Concrete Pavement shall conform to section 380, shall contain a minimum of 600 lbs of cement and fly ash at 20%. The concrete shall contain at least 55% coarse aggregate. The use of a water reducer at manufacturers recommendations will be required. The concrete shall obtain a minimum 4,000 psi at 28 days. The contractor is responsible for the mix design used. The contractor shall submit a mix design for approval at least 2 weeks prior to use.

Any additional cushion material required shall be obtained from the Base Course, Salvaged material available on this project. The existing cushion material shall be watered and rolled per Section 260 of the specifications. Watering and rolling shall be considered incidental to the contract unit price per square yard for 8" NONREINFORCED PCC PAVEMENT.

In lieu of an automatic subgrader operating from a preset line, a motor grader or other suitable equipment may be used to trim the gravel cushion to final grade prior to placement of concrete. There will be no direct payment for trimming of the gravel cushion for PCC pavement. The trimming will be considered incidental to the related items required for PCC Pavement.

Automatic dowel bar inserters will not be allowed on this project.

A construction joint will be sawed whenever new concrete pavement is placed adjacent to existing concrete pavement. The in place pavement was constructed with a transverse joint spacing of 20 ft.

The transverse contraction joints shall be perpendicular to the centerline as detailed in the standard plates 380.01 and 380.08. In multilane areas the transverse contraction joints shall be perpendicular to the centerline and be in a straight line across the width of the pavement. In special situations the Engineer may pre-approve transverse contraction joints that do not meet these requirements. All nonconforming transverse contraction joints that are not pre-approved shall be removed at the Contractor's expense. Any method of placement that cannot produce these requirements shall not be allowed to continue.

In addition to traditional field inspection of reinforcement, a Ground Penetrating Radar (GPR) unit may be used to verify reinforcement locations in the hardened concrete. The GPR may be used anytime prior to the Acceptance of Field Work being issued. All costs related to corrective measures, including but not limited to concrete removal or cutting of reinforcement, price deducts, and delays to the project schedule shall be the responsibility of the Contractor.

The surface of the mainline paving shall be transversely tined. All other areas shall be tined as directed by the Engineer. A self-propelled mechanical tiner will not be required.

The requirement of Standard Plate 380.06 for a Sawed Bevel shall be waived.

ALKALI SILICA REACTIVITY

Fine aggregate shall conform to Section 800.2 D. Alakali Silica Reactivity (ASR) Requirements.

Below is a list of known fine aggregate sources and the average corresponding 14 day expansion values:

Source	Location	Expansion Value
Bachman	Winner, SD	0.335*
Bitterman	Delmont, SD	0.316*
Concrete Materials	Corson, SD	0.170
Croell	Quinn, SD	0.089
Emme Sand & Gravel	Oneil, NE	0.217
Fisher S&G - Vallery Pit	Nisland, SD	0.110
Fisher S&G	Rapid City, SD	0.092
Fisher S&G	Spearfish, SD	0.053
Fisher S&G	Wasta, SD	0.159
Fuchs	Pickstown, SD	0.275*
Higman	Akron, IA	0.198
Higman	Hudson, SD	0.187
Hilde	Madison, SD	0.116
Jensen	Herried, SD	0.276*
L.G. Everist	Brookings, SD	0.186
L.G. Everist	Hawarden, IA	0.166
L.G. Everist	Summit, SD	0.178
Morris	Blunt, SD	0.192
Morris - Richards Pit	Onida, SD	0.188
Myrl & Roys Paving- Nelson Pit	Sioux Falls, SD	0.156
Northern Concrete Agg.	Rauville, SD	0.113
Northern Concrete Agg.	Luverne, MN	0.133
Opperman - Gunvordahl Pit	Burke, SD	0.362*
Opperman - Cahoy Pit	Herrick, SD	0.307*
Opperman - Jones Pit	Burke, SD	0.321*
Opperman - Randall Pit	Pickstown, SD	0.239
Pete Lien & Sons	Creston, SD	0.158
Pete Lien & Sons	Oral, SD	0.129
Pete Lien & Sons	Wasta, SD	0.192
Thorpe Pit	Britton, SD	0.098
Wagner Building Supplies	Pickstown (Wagner), SD	0.241
Winter Brothers- Whitehead Pit	Brookings, SD	0.197

* These sources will require Type V cement in the concrete mix design and Class F (Modified) fly ash as specified.

The Department will use the running average of the last three known expansion test results or less for determining acceptability of source and the required Type of cement. These expansion results are reported in the preceding table. Additional testing, when requested by the Contractor, will be performed by the Department at the Contractor's expense.

The values listed in the table are intended for use in bidding. If a previously tested pit by SDDOT with acceptable test values (less than 0.250) is discovered after letting to require Type V cement (greater than 0.250) the Department will accept financial responsibility for the change from Type II to Type V cement.

Type II or Type V cement will not change the requirement for the fly ash. The cost for either type of cement shall be subsidiary to the contract item.

DOWEL BARS

Dowel bar assemblies shall be placed from approximately Sta. 160+30 to approximately Sta. 175+00. The dowel bar assemblies shall not be placed in the outside 2' of the new pavement. Dowel bar assembles shall be placed anytime the new pavement is 4' in width or wider. Cutting of the typical dowel bar assembly shown on Standard Plate 380.01 will be required.

TABLE OF DOWEL BARS

LOCATION	COMMENTS	ESTIMATED NUMBER OF JOINTS	QUANTITY (Each)
Sta. 160+30 to 162+90 Lt.	2 to 6 bars	14	56
Sta. 162+90 to 172+40 Lt.	6 bars	48	288
Sta. 172+40 to 175+00 Lt.	6 to 2 bars	14	56
Sta. 160+30 to 162+90 Rt.	2 to 6 bars	14	56
Sta. 162+90 to 172+40 Rt.	6 bars	48	288
Sta. 172+40 to 175+00 Rt.	6 to 2 bars	14	56
Totals:			800

ASPHALT CONCRETE COMPOSITE

Mineral aggregate for the Asphalt Concrete Composite shall conform to the requirements of the specifications for Class E, Type 1.

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

The asphalt binder used in the mixture shall be a PG 64-22, PG 64-28, or PG 64-34 Asphalt Binder.

In accordance with the requirements of section 324.5 of the specifications, Asphalt Concrete Composite shall include SS-1h or CSS-1h Asphalt for Flush Seal applied at the rate of 0.05 Gal./Sq.Yd., and Sand for Flush Seal applied at the rate of 8 Lbs./Sq.Yd.

REMOVE, SALVAGE, RELOCATE, AND RESET TRAFFIC SIGN

Throughout the project in place signing will need to be removed, relocated and reset.

STOP signs shall be maintained at the intersections at all times. The Contractor may be required to install STOP signs on temporary supports.

The Contractor shall use care in removal of these signs and posts and shall reinstall the signs and posts upon completion of work. Signs and posts damaged during the removal and reset process shall be replaced by the Contractor at no cost to the State of South Dakota.

All costs associated with the removing, salvaging, relocating and resetting traffic signs and posts, installing and supplying temporary supports for STOP signs shall be incidental to the contract unit price per each for REMOVE, SALVAGE, RELOCATE, AND RESET TRAFFIC SIGN.

DELINEATORS

There are 7 delineators located along US 14 mainline that shall be removed during construction and replaced with new delineators. All costs associated with removal of the delineators and installation of the new delineators along mainline shall be incidental to the contract unit price per each for 4"X4" WHITE DELINEATOR BACK TO BACK WITH 1.12 LB/FT POST. Location of new delineators shall match the location of the existing delineators. In place delineator spacing is typically 528 ft.

There are 3 delineators located in both the NE and NW quadrants of the intersection that shall be removed during construction and replaced with new delineators. All costs associated with removal of the delineators and installation of the new delineators in the quadrants of the intersection shall be incidental to the contract unit price each for 4" TUBULAR WHITE DELINEATOR WITH 1.12 LB/FT POST.

REMOVAL OF EXISTING PAVEMENT MARKING

The existing white edge line shall be removed between Sta. 159+00 and Sta. 176+30. The existing centerline yellow skips shall be removed between Sta. 151+50 and Sta. 183+80. The existing pavement markings are epoxy.

4100 Ft of REMOVE PAVEMENT MARKING, 4" OR EQUIVALENT has been included in the Estimate of Quantities for removal of the existing markings.

The removal process shall remove at least 90% of the deficient line, with no excessive scarring of the existing pavement or cause damage to the joint sealant.

Removal of markings shall not commence until new permanent pavement markings are scheduled to be installed. If there are no markings on the roadway, the Contractor at his own expense, shall install temporary markings as per Section 634.3 B.3. of the Specifications.

PERMANENT PAVEMENT MARKING

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

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

Glass beads shall be applied on the wet paint line at a minimum of eight pounds of glass beads per gallon of paint.

Pavement Marking Paint, White and Yellow will not be measured for payment. Basis of payment will be plans quantity.

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

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

The liquidated damages shall apply up to the Contract Completion Date, as extended. After the completion date, liquidated damages will be assessed in accordance with section 8.7 of the specifications, until the permanent pavement marking is completed, even though the project may be open to traffic.

COLD WEATHER, WATERBORNE PAINT

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

There shall be no adjustment in the contract unit prices should cold weather formulated paint be required.

Cold weather, waterborne paint shall conform to section 980 of the specifications except for the following:

980.1 A - Resin Binder shall be Fastrack XSR manufactured by Dow, or approved equal.

980.1.1 Quantitative Requirements:

The Pigment, Percent By Weight for white: 60.0 – 63.0 and for yellow: 58.5-61.5.

The Pigment, Percent By Weight when tested in accordance with ASTM D3723 for white: 60.0-63.0 and for yellow: 56.1-59.2.

The Non-volatile Vehicle, percent by weight, min. for white: 41.5 and yellow: 41.5 when tested in accordance with FTMS 141c (method 4051.1)

GROOVING FOR COLD APPLIED PLASTIC PAVEMENT MARKING

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

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

The groove shall be made in a single pass dry cut using stacked diamond or carbide tipped cutting heads mounted on a floating head with controls capable of providing uniform depth and alignment. The equipment shall be self- vacuuming and leave the cut groove ready for pavement marking installation. The pavement marking shall be placed in the grooves the same day the grooving is completed. Grooves shall be clean and dry prior to pavement marking application.

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

If the cold applied plastic pavement marking tape (including primer if required) does not immediately follow dry pavement grooving, the following shall apply:

Within 24 hours prior to placing the cold applied plastic pavement marking the groove shall be sandblasted and free of any residue or laitance. If the cold applied plastic pavement marking is not placed within 24 hours of sandblasting, the groove shall be re- sandblasted.

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

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”.

SEED ORIGINATION LIMITATIONS

Grass seed furnished shall be the grass species listed in these plans. The Contractor may use one of the grass varieties listed in these plans for the specified grass species or the Contractor may use a different grass variety of the same grass species specified. If the Contractor uses a grass variety listed in these plans for the specified grass species, the grass seed origin limitations will not apply. If the Contractor uses a grass variety not listed in these plans for the specified grass species, the grass seed furnished must originate in South Dakota, North Dakota, Montana, Wyoming, Nebraska, Iowa, Minnesota, Kansas, Colorado, or Wisconsin. Grass seed grown outside this area may be approved after the Contractor has furnished written certification from three seed suppliers confirming seed grown within this area is not readily available.

FERTILIZING

Application of fertilizer will not be required on this project.

PERMANENT SEEDING

The areas to be seeded comprise of all newly graded areas within the project limits except for the top of roadways and temporary easements under cultivation.

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 estimated area to seed is 1.5 acres.

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

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/

MULCHING (GRASS HAY OR STRAW)

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

An additional 2 tons of Grass Hay or Straw Mulch has been added to the Estimate of Quantities for temporary erosion control on areas determined by the Engineer during construction for temporary stabilization.

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.

An additional quantity of 40 feet of 12” Diameter Erosion Control Wattles has been added to the Estimate of Quantities for temporary erosion and sediment control in highway ditch channels and as an alternative to low flow or high flow silt fence at wetland areas adjacent to the highway.

Erosion control wattles shall remain on the project to decompose.

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

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

TABLE OF EROSION CONTROL WATTLE

Station	L/R	Diameter (Inch)	Location	Quantity (Ft)
169+75	L	12	Culvert Inlet	30
169+75	R	12	Culvert Inlet	30
			Additional Quantity:	40
			Total:	100

REMOVE AND RESET EROSION CONTROL WATTLE

Erosion control wattles may be removed and reset as necessary as work progresses. The erosion control wattles removed and reset shall be in useable condition. All costs for removing and resetting the erosion control wattles shall be incidental to the contract unit price per foot for REMOVE AND RESET EROSION CONTROL WATTLE.

REFURBISH MAILBOXES

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

TABLE OF REFURBISH MAILBOXES

Location		SINGLE MAILBOX
Sta.	SIDE	EACH
174+53	Lt	1

If large mailboxes are located at double mailbox installations, a single post may need to be used for the large mailbox.

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

NO PASSING ZONE SIGNS

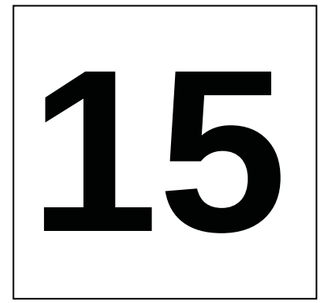
A W14-3 No Passing Zone sign shall be installed at Sta 151+50 (Lt) and Sta 183+80 (Rt). These signs shall measure 48”x48”x36” (5.6 SqFt per sign). The signs shall be mounted on 2.0” x 2.0” Perforated Tube Posts with Square Tube Anchor Sleeve bases. The estimated length of each post is 11 Ft.

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

DATE DECALS

The Contractor shall furnish and affix a date decal to each new sign installed.

Date decals shall be self-adhesive weather resistant stickers with removable paper backing, approximately 2” X 2” in size. The date decal shall display the last two digits of the year the sign was manufactured with black numerals on a white background.



One decal shall be placed in the extreme lower left corner of the front of each extruded aluminum panel sign, or the extreme lower left corner of the back of each flat aluminum sign.

Sign supports or other obstructions shall not block the view of the date decal upon completion of the sign installation.

All costs to furnish and install date decals on new signs shall be incidental to the contract unit price per square foot for FLAT ALUMINUM SIGN, NONREMOVABLE COPY SUPER/VERY HIGH INTENSITY.

NEW PERMANENT SIGNING

Sign Design

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

All sign material shall comply with Section 982 of the Specifications.

All upper/lower case letters and numerals shall be as required per the MUTCD, the latest edition of "Standard Highway Signs”.

Sign Sheeting

Signs shall be constructed using Super/Very High Intensity (ASTM D4956 Type XI) reflective sheeting.

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

All black legend and borders shall be nonreflectorized (unless otherwise specified in these plans).

Sign Installation Hardware

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

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

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

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

All costs associated with furnishing and installing the new permanent signs, and with furnishing and installing stiffeners and hardware shall be incidental to the contract unit price per square foot for FLAT ALUMINUM SIGN, NONREMOVABLE COPY SUPER/VERY HIGH INTENSITY.

SQUARE TUBE ANCHOR SLEEVE

The Contractor shall furnish and install new square tube anchor sleeve, as shown elsewhere in these plans, as follows:

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

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

STORM WATER POLLUTION PREVENTION PLAN CHECKLIST

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

❖ **SITE DESCRIPTION (4.2 1)**

- **Project Limits: See Title Sheet (4.2 1.b)**
- **Project Description: See Title Sheet (4.2 1.a.)**
- **Site Map(s): See Title Sheet and Plans (4.2 1.f. (1)-(6))**
- **Major Soil Disturbing Activities** (check all that apply)
  - ☒ Clearing and grubbing
  - ☐ Excavation/borrow
  - ☒ Grading and shaping
  - ☒ Filling
  - ☐ Cutting and filling
  - ☐ Other (describe):
- **Total Project Area** 6 Acres **(4.2 1.b.)**
- **Total Area To Be Disturbed** 2.5 Acres **(4.2 1.b.)**
- **Existing Vegetative Cover (%)** 75%
- **Soil Properties:** AASHTO Soil Series Classification A-4, A-6 & A-7 **(4.2 1. d.)**
- **Name of Receiving Water Body/Bodies** Medary Creek **(4.2 1.e.)**

❖ **ORDER OF CONSTRUCTION ACTIVITIES (4.2 1.c.)**

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

- **Special sequencing requirements (**see sheet).
- **Install perimeter protection where runoff sheets from the site.**
- **Install channel and ditch bottom protection.**
- **Clearing and grubbing.**
- **Remove and store topsoil.**
- **Stabilize disturbed areas.**
- **Install utilities.**
- **Install inlet and culvert protection after completing storm drainage and other utility installations.**
- **Complete final grading.**
- **Complete final paving and sealing of concrete.**
- **Complete traffic control installation and protection devices.**
- **Reseed areas disturbed by removal activities**.

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

(Check all that apply)

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

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

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

    All liquid waste materials will be collected and stored in sealed metal containers approved by the project engineer. All trash and construction debris from the site will be deposited in the approved containers. Containers will be serviced as necessary, and the trash will be hauled to an approved disposal site or licensed landfill. All onsite personnel will be instructed in the proper procedures for waste disposal, and notices stating proper practices will be posted in the field office. The general contractor's representative responsible for the conduct of work on the site will be responsible for seeing waste disposal procedures are followed.
  - **Hazardous Waste**

    All hazardous waste materials will be disposed of in a manner specified by local or state regulations or by the manufacturer. Site personnel will be instructed in these practices, and the individual designated as the contractor's on-site representative will be responsible for seeing that these practices are followed.
  - **Sanitary Waste**

    Portable sanitary facilities will be provided on all construction sites. Sanitary waste will be collected from the portable units in a timely manner by a licensed waste management contractor or as required by any local regulations.

❖ **Maintenance and Inspection (4.2 3. and 4.2 4.)**

- **Maintenance and Inspection Practices**
  - Inspections will be conducted at least one time per week and after a storm event of 0.50 inches or greater.
  - All controls will be maintained in good working order. Necessary repairs will be initiated within 24 hours of the site inspection report.
  - Silt fence will be inspected for depth of sediment and for tears in order to ensure the fabric is securely attached to the posts and that the posts are well anchored. Sediment buildup will be removed from the silt fence when it reaches $^{1}/_{3}$ of the height of the silt fence.
  - Sediment basins and traps will be checked. Sediment will be removed when depth reaches approximately 50 percent of the structure's capacity, and at the conclusion of the construction.
  - Check dams will be inspected for stability. Sediment will be removed when depth reaches ½ the height of the dam.
  - All seeded areas will be checked for bare spots, washouts, and vigorous growth free of significant weed infestations.
  - Inspection and maintenance reports will be prepared on form DOT 298 for each site inspection, this form will also be used to document changes to the SWPPP. A copy of the completed inspection form will be filed with the SWPPP documents.
  - The SDDOT Project Engineer and contractor's site superintendent are responsible for inspections. Maintenance, repair activities are the responsibility of the contractor. The SDDOT Project Engineer will complete the inspection and maintenance reports and distribute copies per the distribution instructions on DOT 298.

❖ **Non-Storm Water Discharges (3.0)**

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

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

❖ **Materials Inventory (4.2. 2.c.(2))**

The following materials or substances are expected to be present on the site during the construction period. These materials will be handled as noted under the headings "EROSION AND SEDIMENT CONTROLS" and "SPILL PREVENTION" (check all that apply).

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

❖ **Spill Prevention (4.2 2.c.(2))**

➢ **Material Management**

- Housekeeping
  - Only needed products will be stored on-site by the contractor.
  - Except for bulk materials the contractor will store all materials under cover and in appropriate containers.
  - Products must be stored in original containers and labeled.
  - Material mixing will be conducted in accordance with the manufacturer's recommendations.
  - When possible, all products will be completely used before properly disposing of the container off site.
  - The manufacturer's directions for disposal of materials and containers will be followed.
  - The contractor's site superintendent will inspect materials storage areas regularly to ensure proper use and disposal.
  - Dust generated will be controlled in an environmentally safe manner.
  - Vegetation areas not essential to the construction project will be preserved and maintained as noted on the plans.

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

➢ **Product Specific Practices (6.8)**

- Petroleum Products
  All on-site vehicles will be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers which are clearly labeled.
- Fertilizers
  Fertilizers will be applied only in the amounts specified by the SDDOT. Once applied, fertilizers will be worked into the soil to limit the exposure to storm water. Fertilizers will be stored in an enclosed area. The contents of partially used fertilizer bags will be transferred to sealable containers to avoid spills.
- Paints
  All containers will be tightly sealed and stored when not required for use. The excess will be disposed of according to the manufacturer's instructions and any applicable state and local regulations.
- Concrete Trucks
  Contractors will provide designated truck washout areas on the site. These areas must be self contained and not connected to any storm water outlet of the site. Upon completion of construction washout areas will be properly stabilized.

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

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

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

➢ **Spill Response (4.2 2 c.(2))**

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

- The contractor's site superintendent will be notified immediately when a spill or the threat of a spill is observed. The superintendent will assess the situation and determine the appropriate response.
- If spills represent an imminent threat of escaping erosion and sediment controls and entering receiving waters, personnel will be directed to respond immediately to contain the release and notify the superintendent after the situation has been stabilized.
- Spill kits containing appropriate materials and equipment for spill response and cleanup will be maintained by the contractor at the site.
- If oil sheen is observed on surface water (e.g. settling ponds, detention ponds, swales), action will be taken immediately to remove the material causing the sheen. The contractor will use appropriate materials to contain and absorb the spill. The source of the oil sheen will also be identified and removed or repaired as necessary to prevent further releases.
- If a spill occurs the superintendent or the superintendent's designee will be responsible for completing the spill reporting form and for reporting the spill to SD DENR.
- Personnel with primary responsibility for spill response and clean up will receive training by the contractor's site superintendent or designee. The training must include identifying the location of the spill kits and other spill response equipment and the use of spill response materials.
- Spill response equipment will be inspected and maintained as necessary to replace any materials used in spill response activities.

❖ **Spill Notification**

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

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

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

❖ **Construction Changes (4.4)**

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

❖ CERTIFICATIONS

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

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

➢ **South Dakota Department of Transportation**

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

Authorized Signature (See the General Permit, Section 6.7.1.C.)

➢ **Prime Contractor**

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

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

Authorized Signature

❖ CONTACT INFORMATION

➢ **Contractor Information**:

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

➢ **Erosion Control Supervisor**

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

➢ **SDDOT Project Engineer**

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

➢ **SD DENR Contact Spill Reporting**

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

➢ **SD DENR Contact for Hazardous Materials.**

- (605) 773-3153

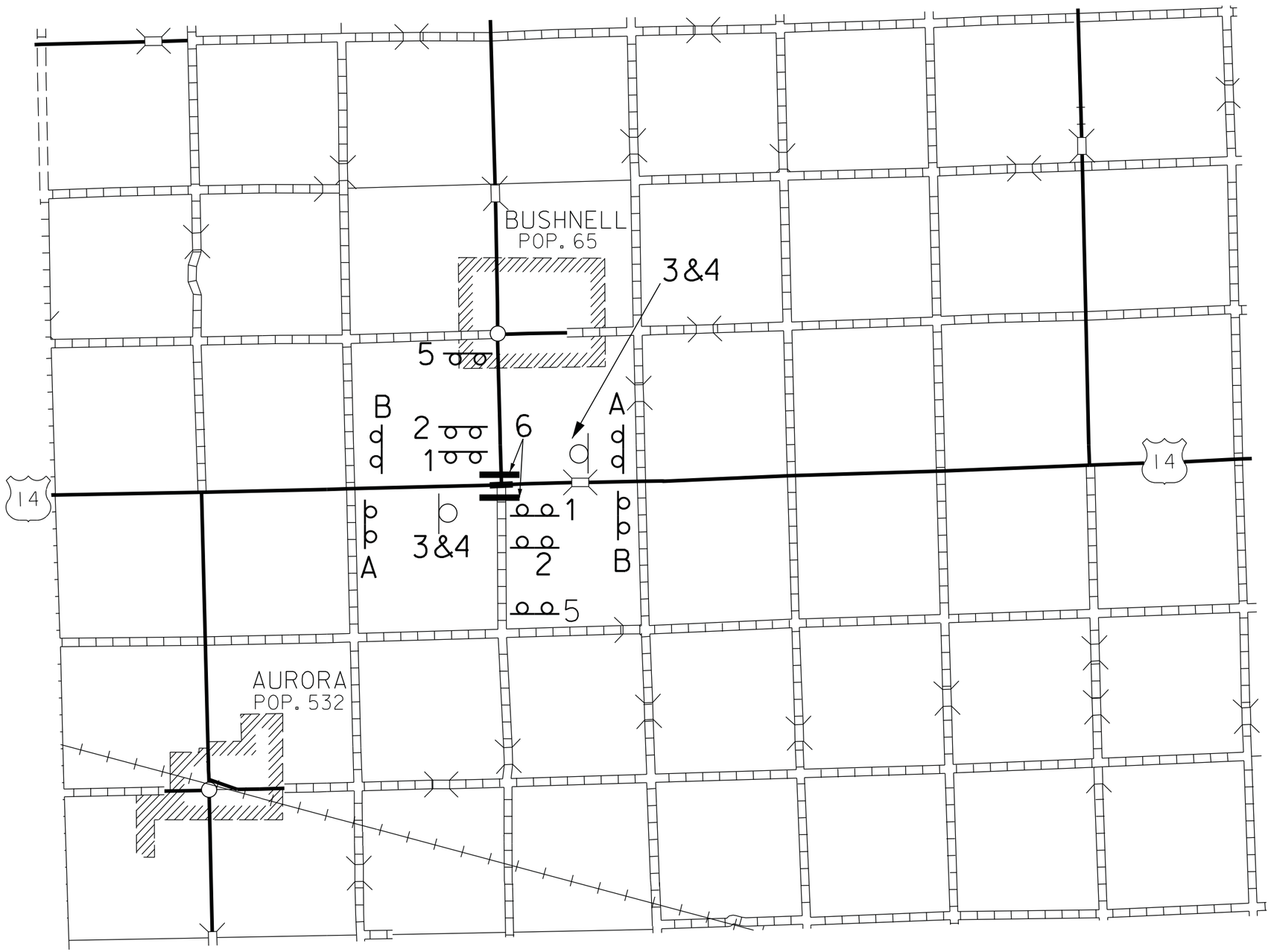
➢ **National Response Center Hotline**

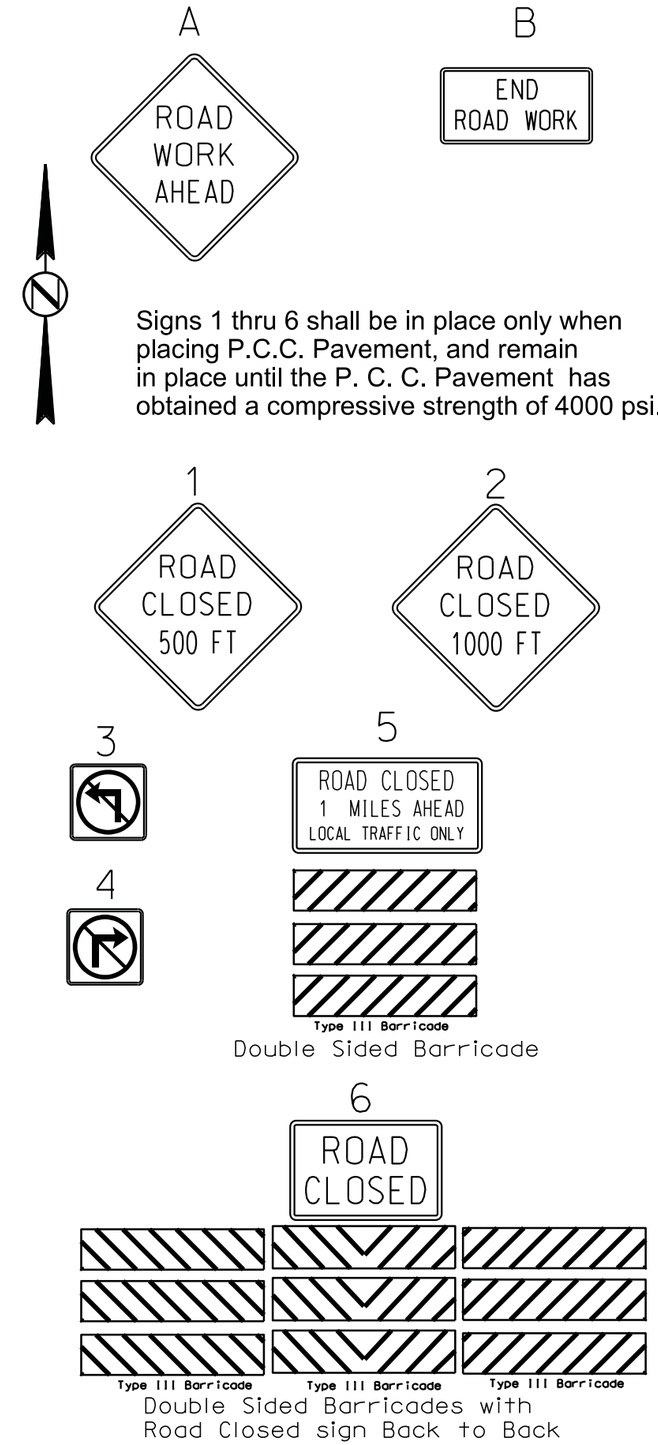
- (800) 424-8802.

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	PH 0014(211)427	16	60

Plotting Date: 03/19/2015

FIXED LOCATION GROUND MOUNTED BREAKAWAY SUPPORT SIGNS





Signs 1 thru 6 shall be in place only when placing P.C.C. Pavement, and remain in place until the P. C. C. Pavement has obtained a compressive strength of 4000 psi.

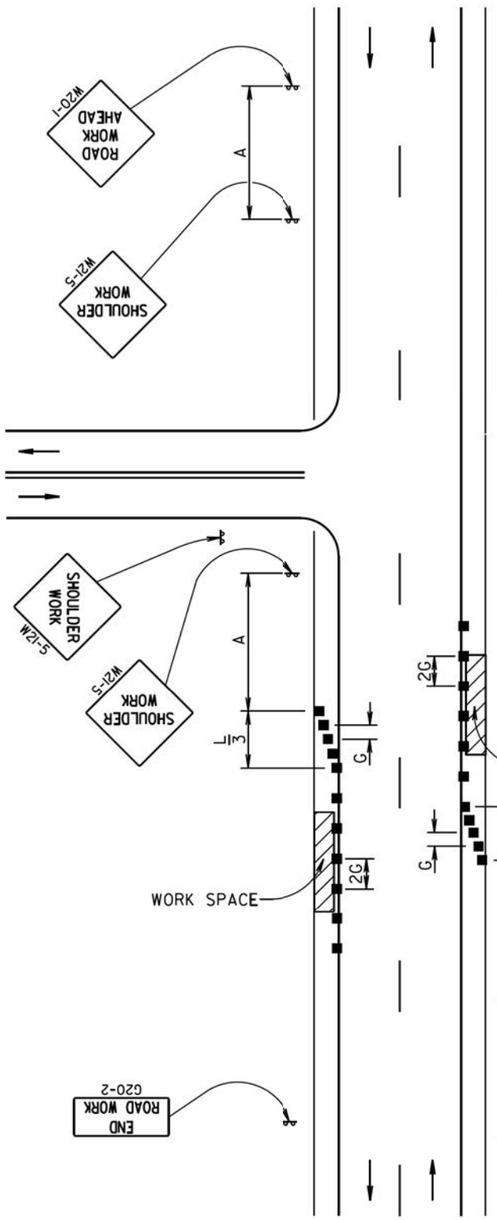
EXACT LOCATION OF SIGNS TO BE VERIFIED IN THE FIELD BY THE ENGINEER.

PLOT SCALE - 1:4000

PLOTTED FROM - TRAB17982

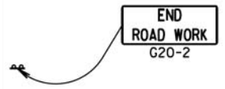
PLOT NAME - 4

FILE - ...\04GN FIXED SUPPORT SIGNS.DGN



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

■ Channelizing Device



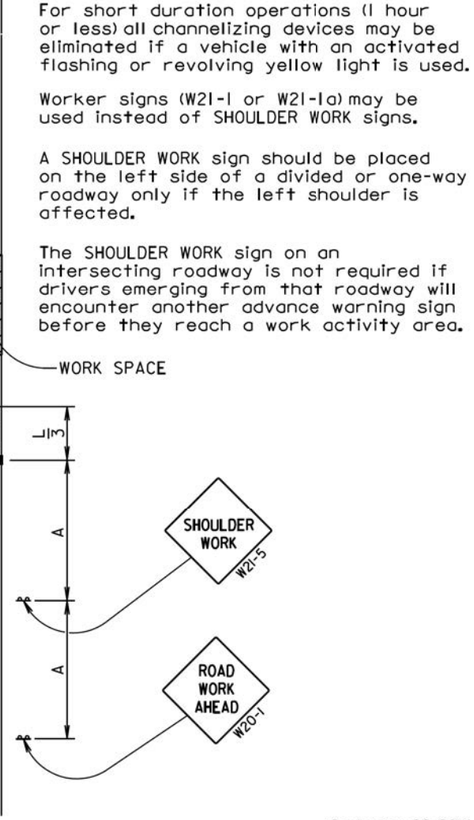
The channelizing devices shall be drums or 42" cones if traffic control must remain overnight.

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

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

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

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



September 22, 2014

Published Date: 1st Qtr. 2015	SDDOT	GUIDES FOR TRAFFIC CONTROL DEVICES WORK ON SHOULDERS	PLATE NUMBER 634.03 Sheet 1 of 1

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

Flagger

■ Channelizing Device

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

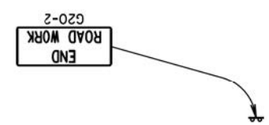
The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (1 hour or less).

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

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

The channelizing devices shall be drums or 42" cones.

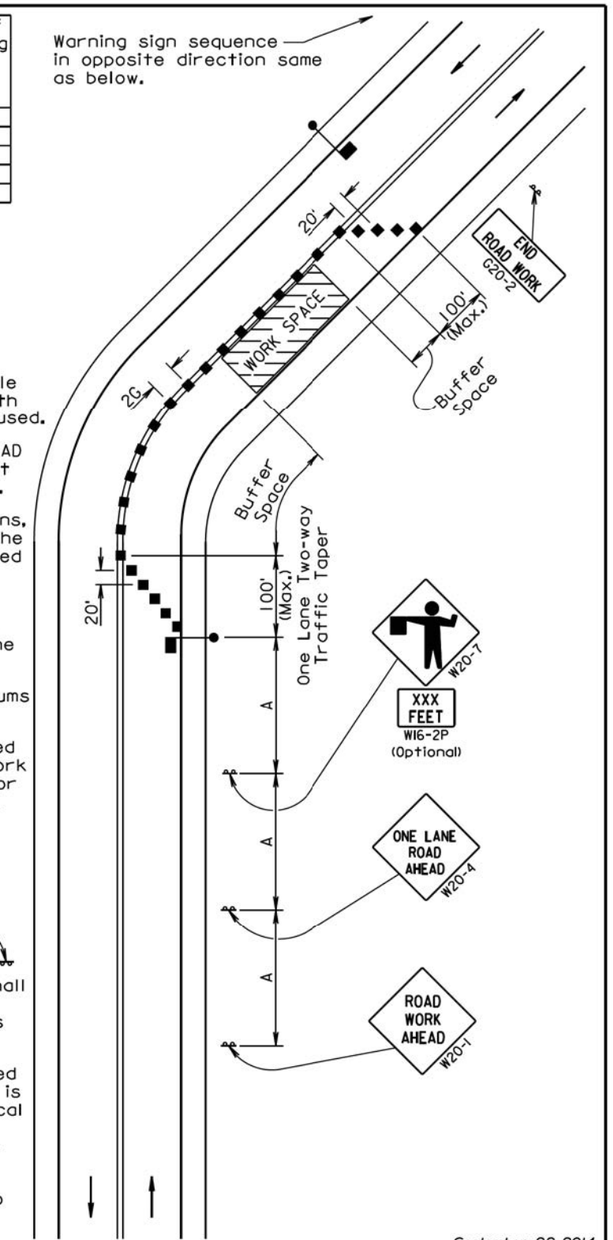
Channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.



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

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

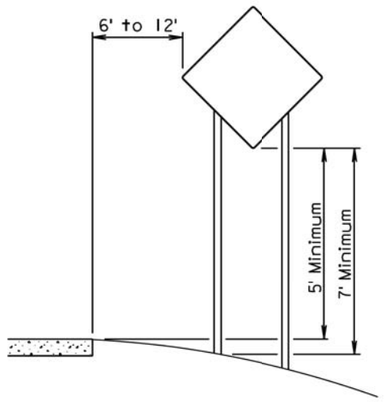
The length of A may be adjusted to fit field conditions.



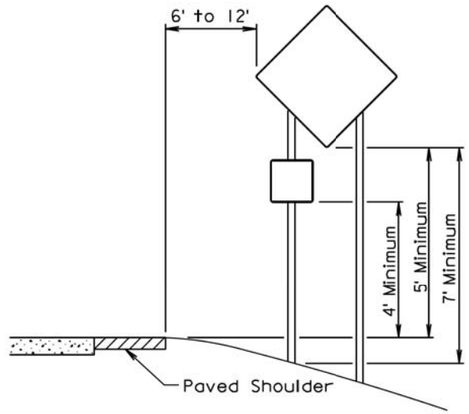
September 22, 2014

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

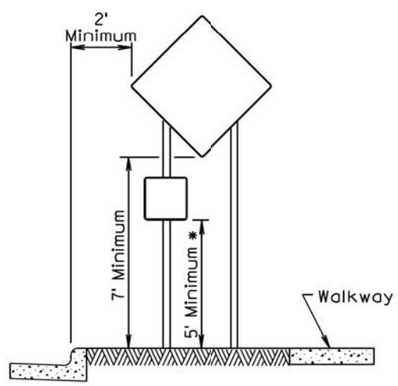
PLOT SCALE - 1:200
PLOT NAME - 1
FILE - ...\63403_&_63423.DGN
PLOTTED FROM - TRAB17892



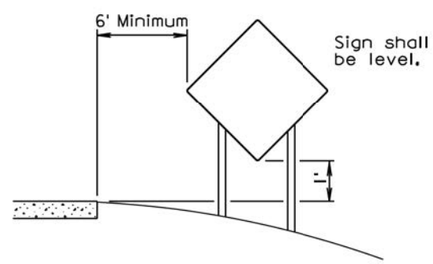
RURAL DISTRICT



RURAL DISTRICT WITH SUPPLEMENTAL PLATE



URBAN DISTRICT



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

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

September 22, 2014

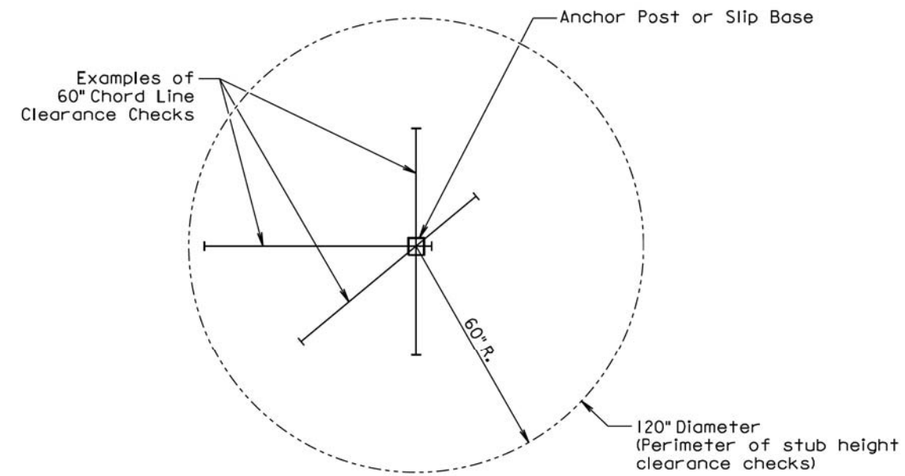
Published Date: 1st Qtr. 2015

SDDOT

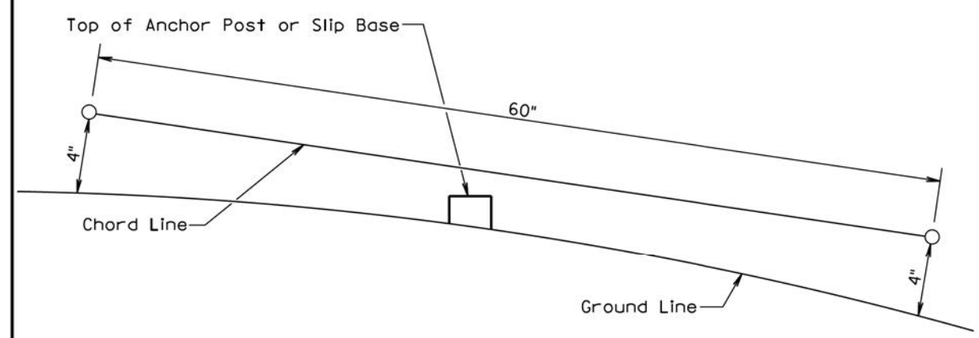
CRASHWORTHY SIGN SUPPORTS
(Typical Construction Signing)

PLATE NUMBER 634.85

Sheet 1 of 1



PLAN VIEW
(Examples of stub height clearance checks)



ELEVATION VIEW

GENERAL NOTES:

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

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

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

July 1, 2005

Published Date: 1st Qtr. 2015

SDDOT

BREAKAWAY SUPPORT STUB CLEARANCE

PLATE NUMBER 634.99

Sheet 1 of 1

PLOT SCALE - 1:200
PLOT NAME - 2
FILE - ...\63485_&_63499.DGN
PLOTTED FROM - TRAB17892

ITEMIZED LIST FOR TRAFFIC CONTROL

SIGN CODE	DESCRIPTION	CONVENTIONAL ROAD NUMBER	SIGN SIZE	UNITS PER SIGN	UNITS
R3-1	NO RIGHT TURN (symbol)	2	24" x 24"	16	32
R3-2	NO LEFT TURN (symbol)	2	24" x 24"	16	32
R11-2	ROAD CLOSED	4	48" x 30"	27	108
R11-3a	ROAD CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY	2	60" x 30"	30	60
W5-1	ROAD NARROWS	2	48" x 48"	34	68
W8-17	SHOULDER DROP-OFF (symbol)	2	48" x 48"	34	68
W8-17P	SHOULDER DROP-OFF (plaque)	2	30" x 24"	18	36
W20-1	ROAD WORK AHEAD	4	48" x 48"	34	136
W20-3	ROAD CLOSED xxx FT	4	48" x 48"	34	136
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	34	68
W20-7	FLAGGER (symbol)	4	48" x 48"	34	136
W21-5	SHOULDER WORK	4	48" x 48"	34	136
G20-2	END ROAD WORK	2	36" x 18"	17	34
-	TYPE 3 BARRICADE - 6' double sided	6		42	252
-	TYPE 3 BARRICADE - 8' double sided	6		56	336
				TOTAL UNITS	**1638**

PLOTTED FROM - TRAB17882

MAINLINE

Type	Station			Northing	Easting
POB	156+53.714			192298.891	2844692.015
		TL= 1287.86	N 87°45'34" E		
PI	169+41.57			192349.239	2845978.893
		TL= 1052.50	N 87°41'37" E		
POE	179+94.07			192391.597	2847030.540

Cross Road at Sta. 169+42

Type	Station			Northing	Easting
POB	0+00.00			191815.504	2845999.650
		TL= 1062.20	N 2°07'20" W		
POE	10+62.20			192876.980	2845960.315

CONTROL DATA

HORIZONTAL AND VERTICAL CONTROL POINTS						
POINT	STATION	OFFSET	DESCRIPTION	NORTHING	EASTING	ELEVATION
CP 10	157+00	74' Lt	1' east of ROW Marker	192374.232	2844735.007	1663.23
CP 16	169+10	120' Lt		192467.921	2845942.646	1667.08
CP 17	177+83	75' Rt		192307.782	2846823.041	1668.52

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	PH 0014(211)427	21	60

Plotting Date: 03/19/2015

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

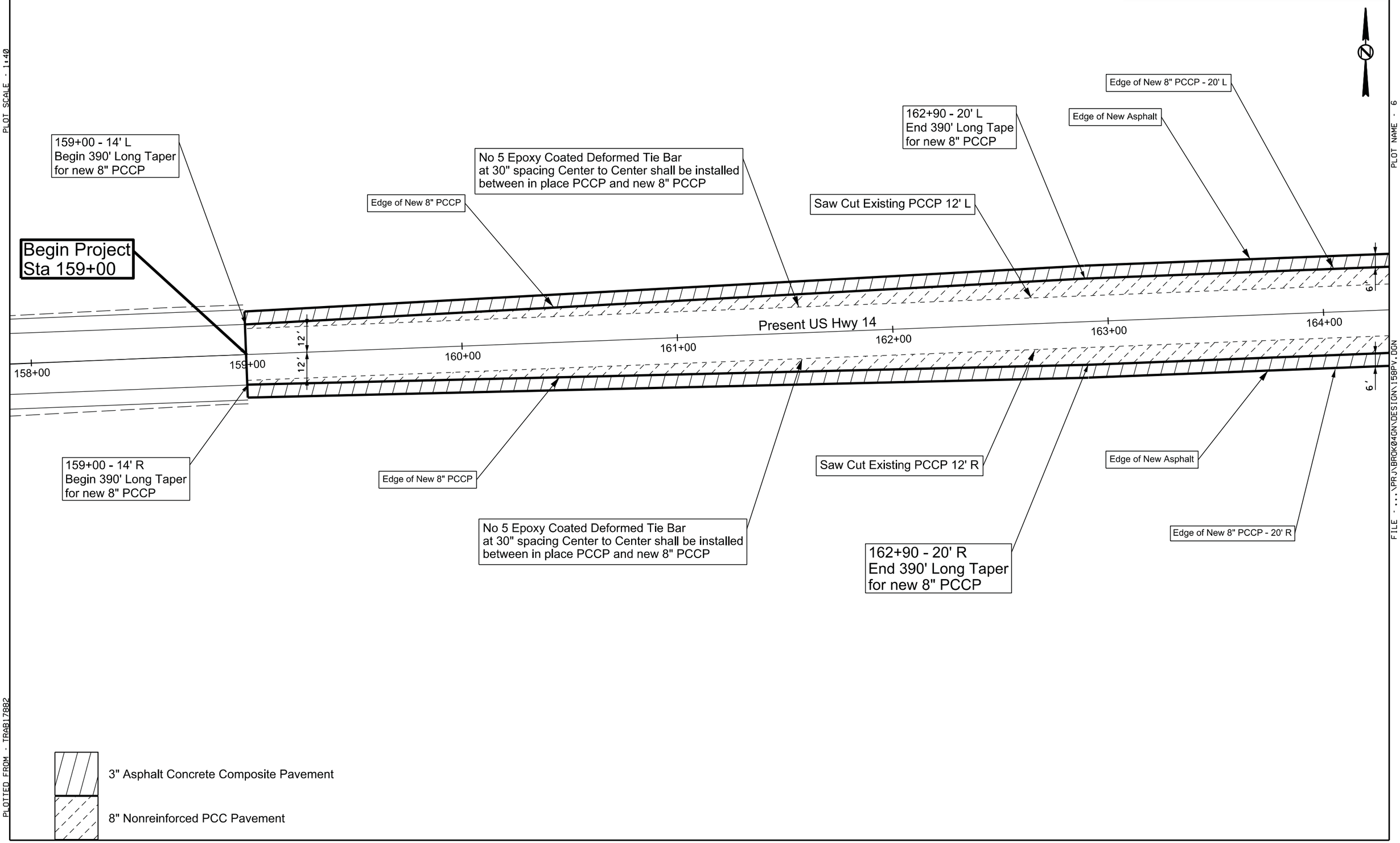
State and National Line
County Line
Section Line
Quarter Line
Sixteenth Line
Property Line
Construction Line
R. O. W. Line
New R. O. W. Line
Cut and Fill Limits
Control of Access
New Control of Access
Proposed ROW
(After Property Disposal)

Plot Scale - 1:200
Plotted From - trab17882
File - ...\Brok04GN\Design\toposymb.dgn

SURFACING REMOVAL AND SURFACE WIDENING LAYOUT

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	PH 0014(211)427	22	60

Plotting Date: 03/30/2015



PLOT SCALE - 1:40

PLOT NAME - 6

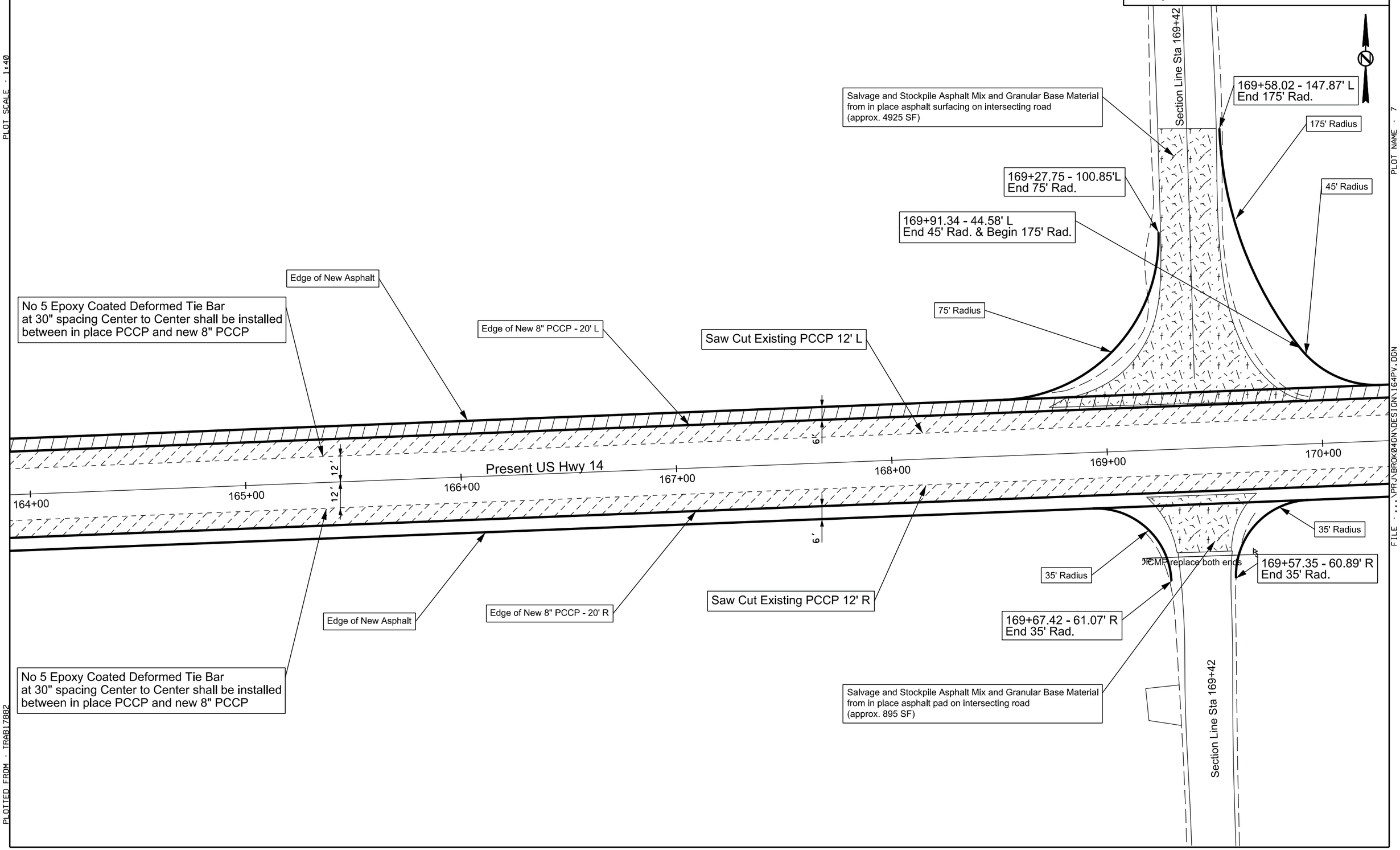
FILE - ...\PRJ\BROK04GN\DESIGN\158PV.DGN

PLOTTED FROM - TRAB17882

SURFACING REMOVAL AND SURFACE WIDENING LAYOUT

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	PH 0014(211)427	23	60

Plotting Date: 03/30/2015



PLOT SCALE - 1:40

PLOT NAME - 7

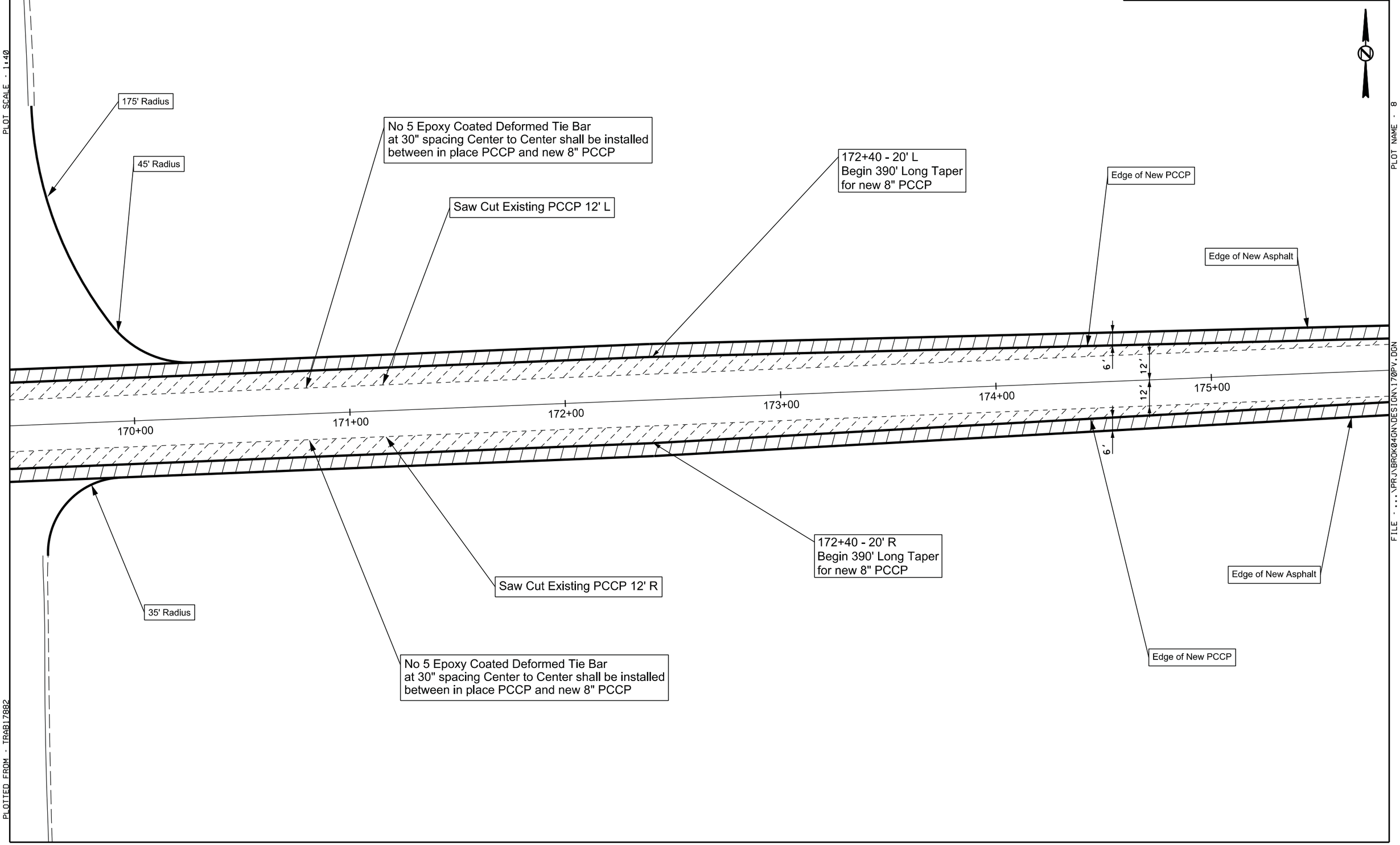
FILE - ...\PRJ\BROK04GN\DESIGN\164PV.DGN

PLOTTED FROM - TRAB17882

SURFACING REMOVAL AND SURFACE WIDENING LAYOUT

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	PH 0014(211)427	24	60

Plotting Date: 03/30/2015



PLOT SCALE - 1:40

PLOT NAME - 8

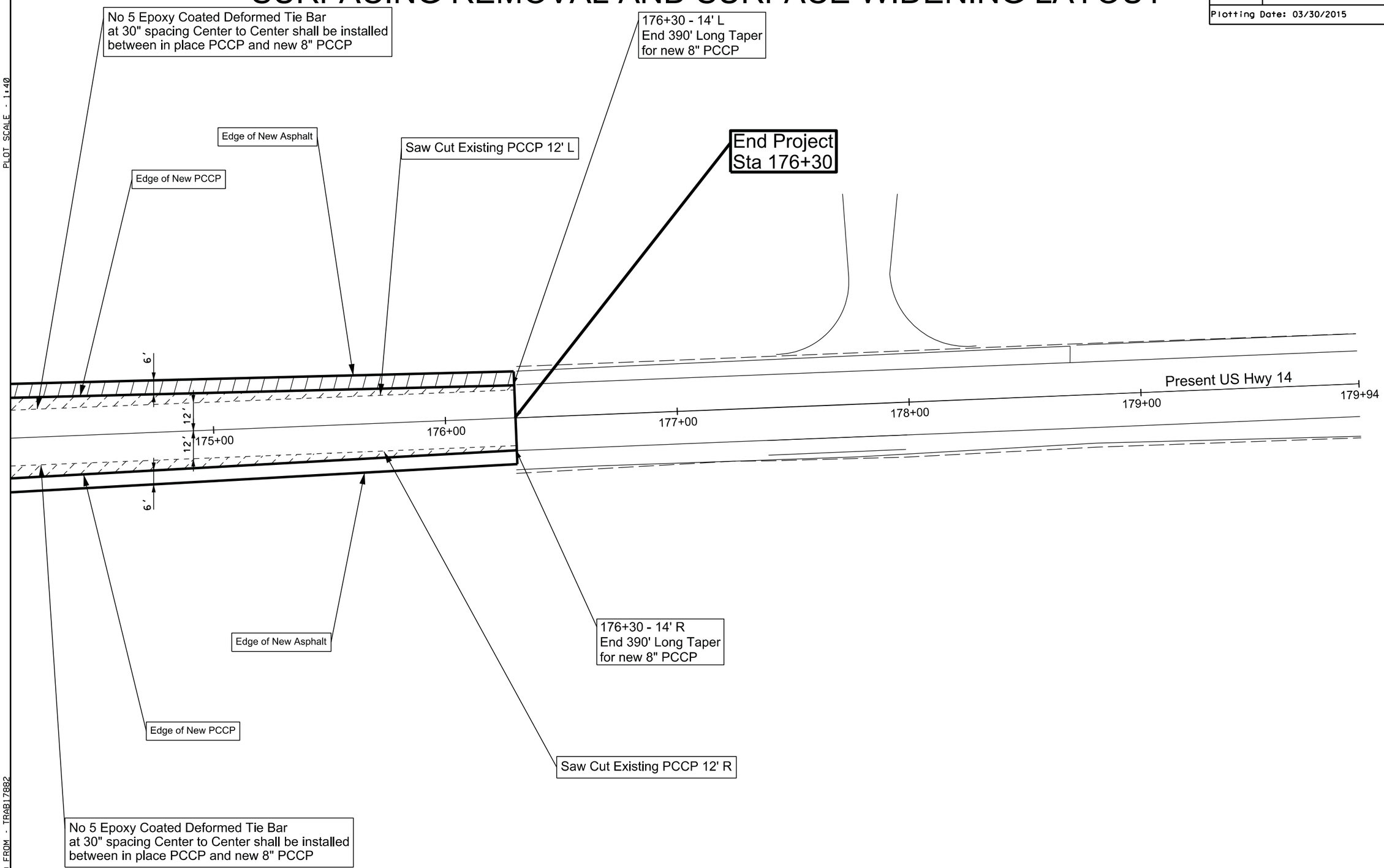
FILE - ...\PRJ\BROK04GN\DESIGN\170PV.DGN

PLOTTED FROM - TRAB17882

SURFACING REMOVAL AND SURFACE WIDENING LAYOUT

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	PH 0014(211)427	25	60

Plotting Date: 03/30/2015



PLOT SCALE - 1:40

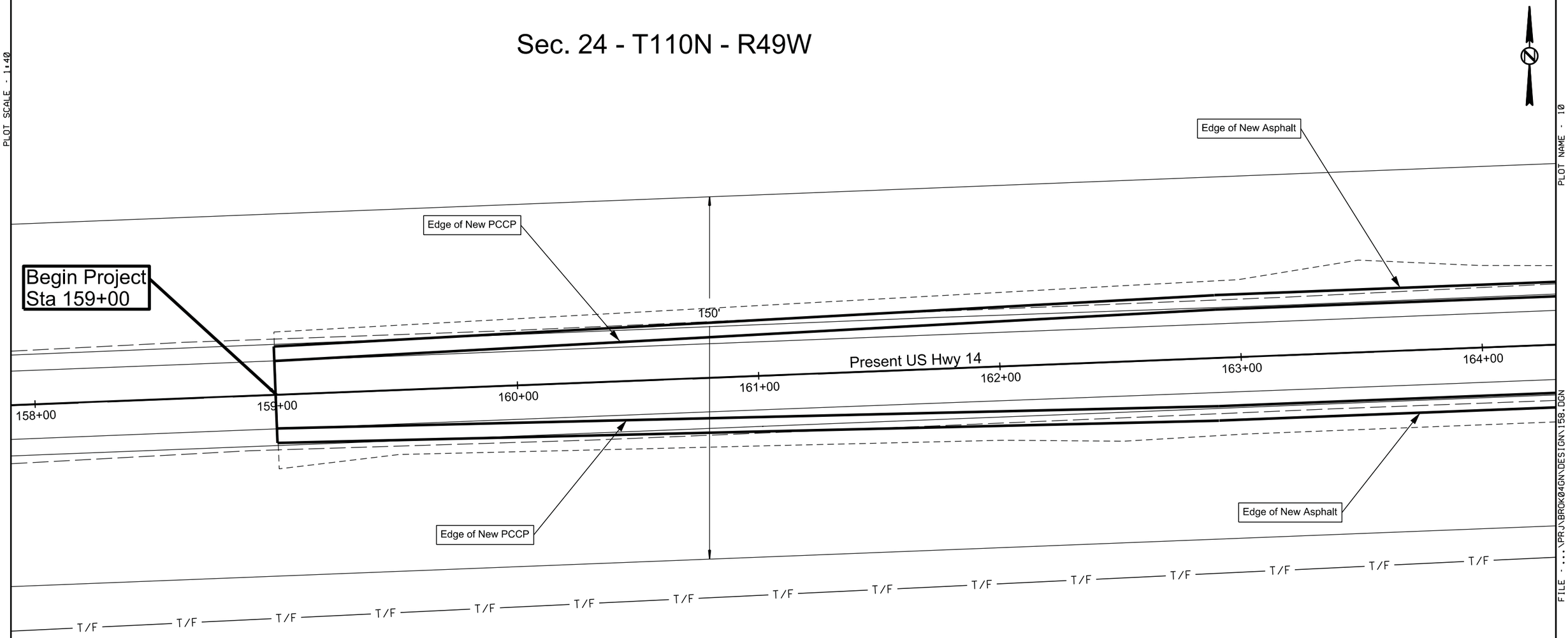
PLOTTED FROM - TRAB17882

PLOT NAME - 9

FILE - ...\PRJ\BROK04GN\DESIGN\175PV.DGN

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	PH 0014(211)427	26	60

Plotting Date: 03/30/2015



PLOT SCALE - 1:40

PLOT NAME - 10

FILE - ...\PRJ\BROK04GN\DESIGN\158.DGN

PLOTTED FROM - TRAB17882

Rev. 4-23-15 SLS

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	PH 0014(211)427	27	60

Plotting Date: 04/23/2015

Remove, Salvage, Relocate
and Reset Traffic Sign:
164+55 Rt (TODS Sign on 2 Wood Posts)
166+45 Rt (Directional Sign on 2 Wood Posts)
167+33 Lt (US14 Route Marker on Square Tube Post)
169+12 Lt (Stop Sign on Square Tube Post)
169+67 Rt (Stop Sign on U Channel Post)
169+70 Lt (Rural Street Sign on Square Tube Post)

Remove Pipe Ends
at the following locations:
169+10-54'L
169+70-54'L
169+09-50'R
169+75-50'R
(24" CMP Safety End)

168+92-54'L to 169+10-54' L
Install 24"-18' CMP and
Safety End

169+09-50'R
Install 24" CMP Safety End

169+23-143'L to 169+65-143' L
Cleanout Pipe Culvert

169+68-54'L to 170+02-54' L
Install 24"-34' CMP and
Safety End

169+75-50'R
Install 24" CMP Safety End

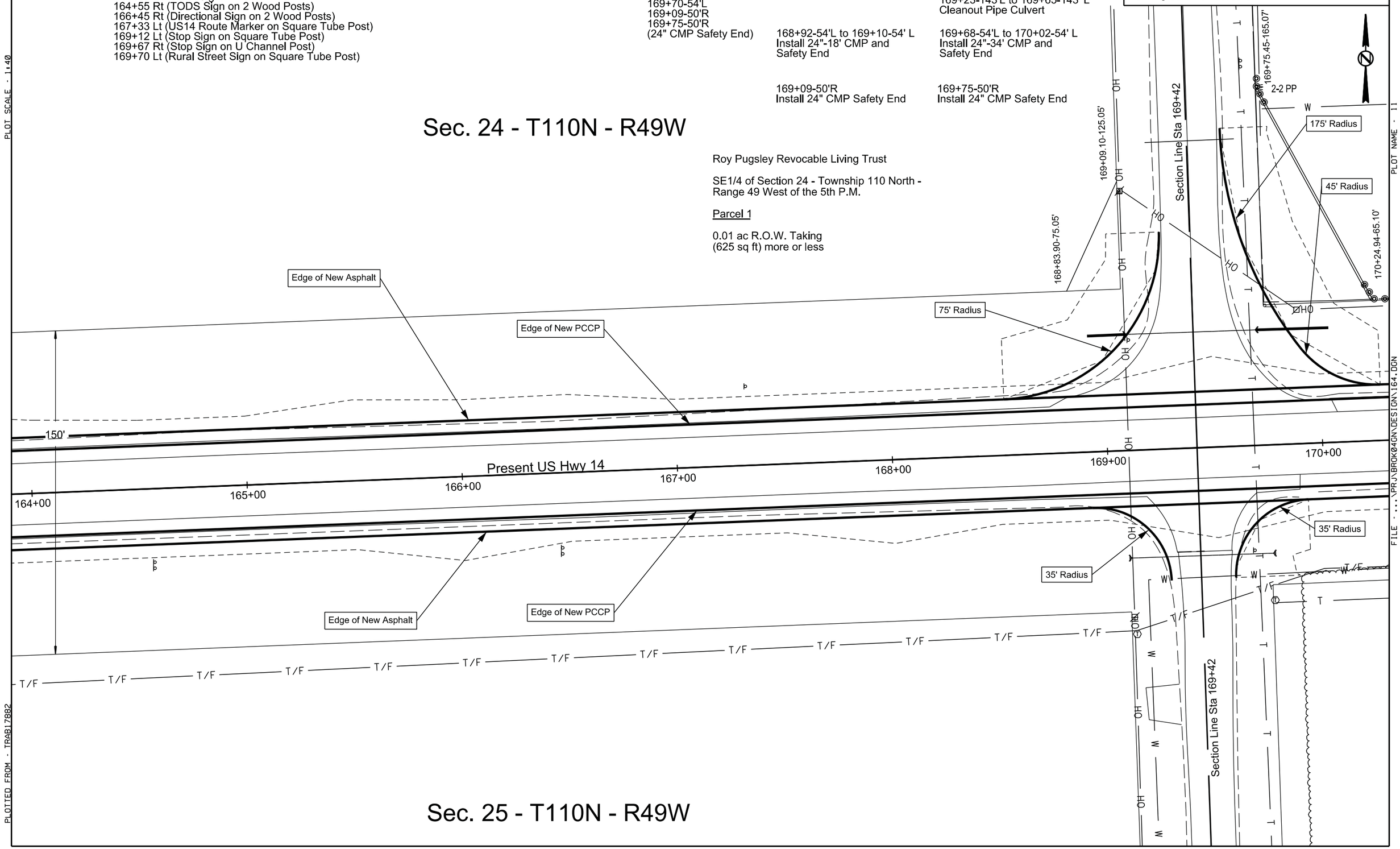
Sec. 24 - T110N - R49W

Roy Pugsley Revocable Living Trust

SE1/4 of Section 24 - Township 110 North -
Range 49 West of the 5th P.M.

Parcel 1

0.01 ac R.O.W. Taking
(625 sq ft) more or less



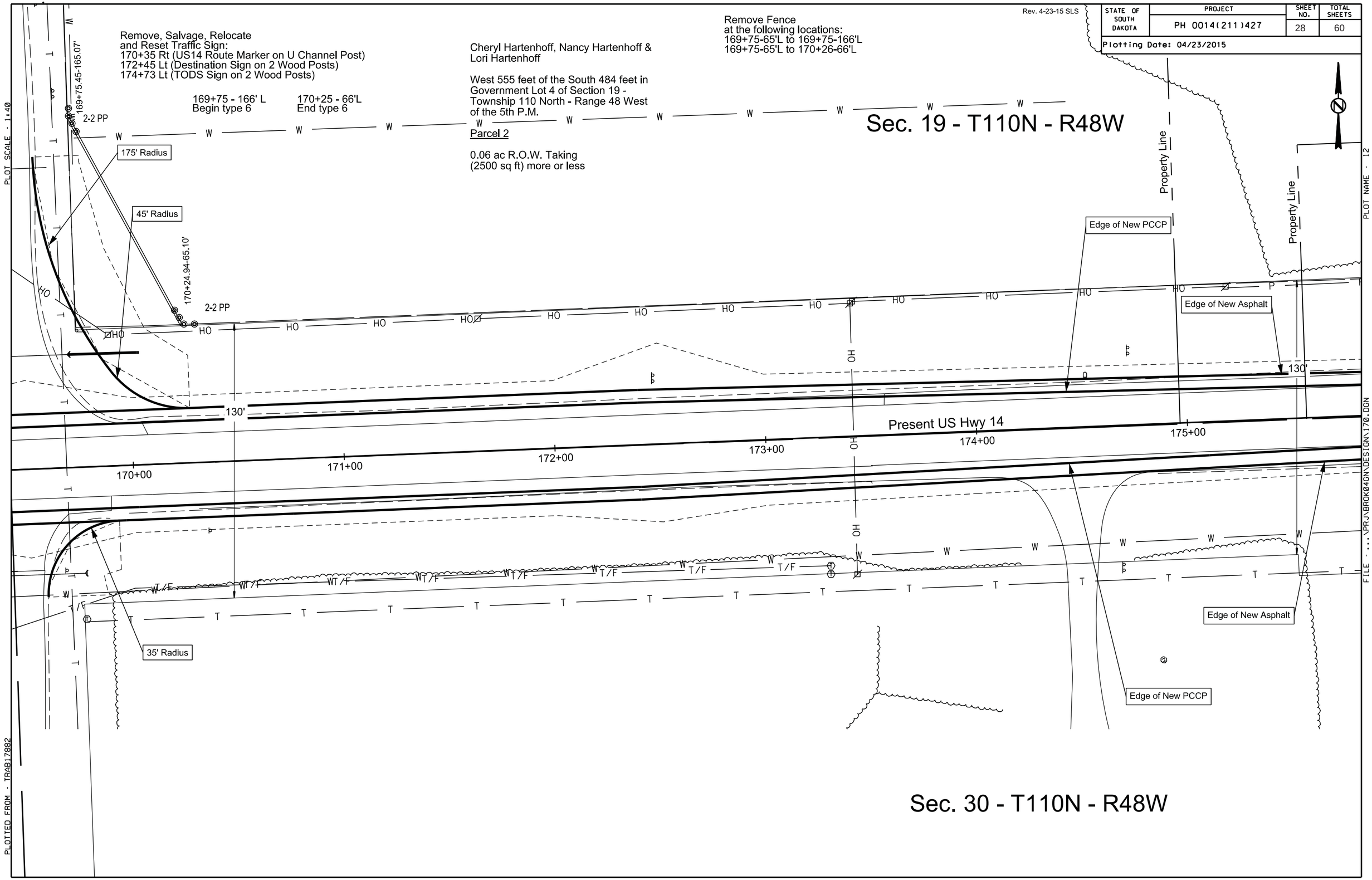
Sec. 25 - T110N - R49W

PLOT SCALE - 1:40
PLOT NAME - 11
FILE - ...\PRJ\BROK04GN\DESIGN\164.DGN
PLOTTED FROM - TRAB17882

Rev. 4-23-15 SLS

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	PH 0014(211)427	28	60

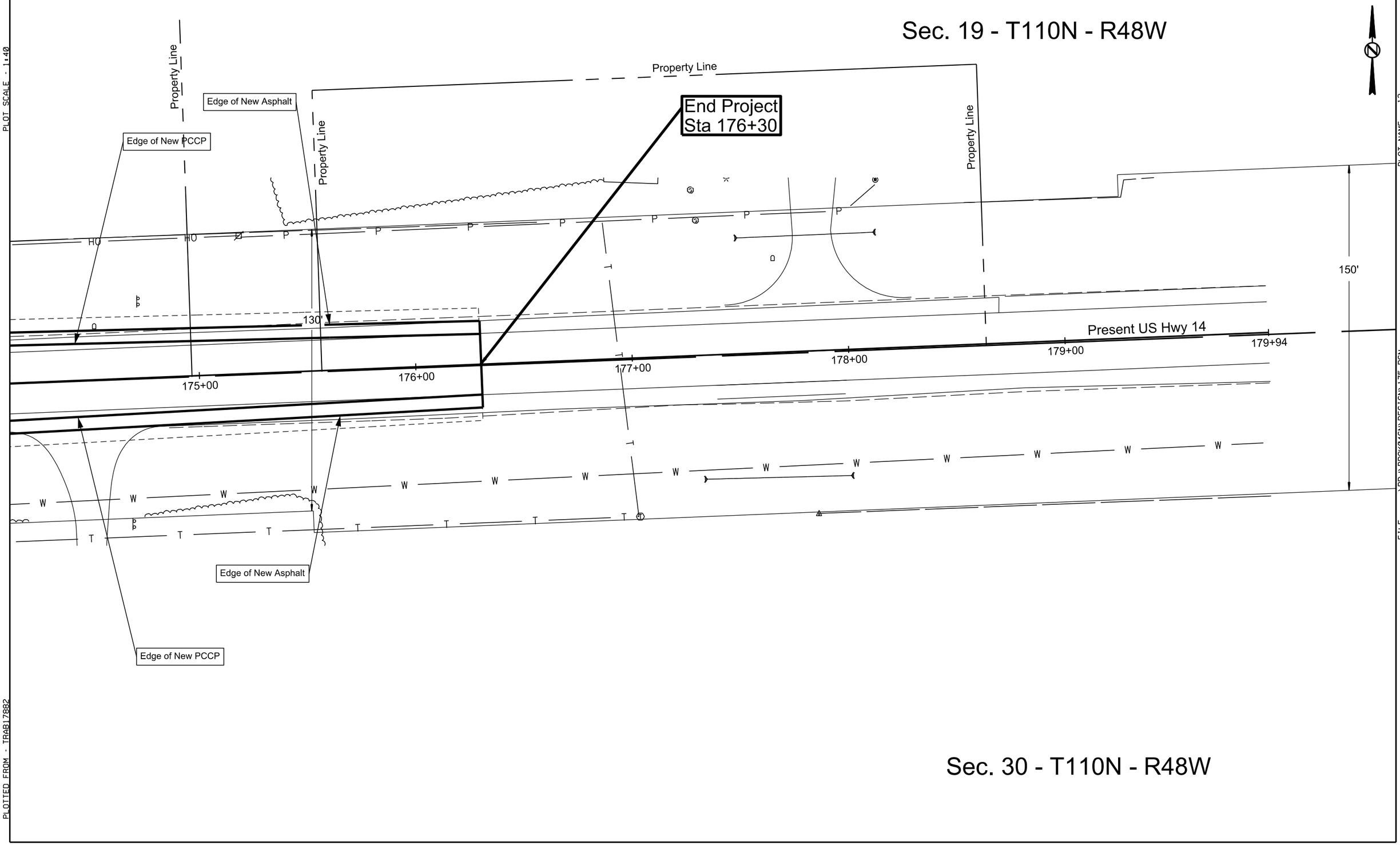
Plotting Date: 04/23/2015



STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	PH 0014(211)427	29	60

Plotting Date: 03/30/2015

174+53 Lt
Refurbish Single Mailbox



PLOT SCALE - 1:40

PLOT NAME - 13

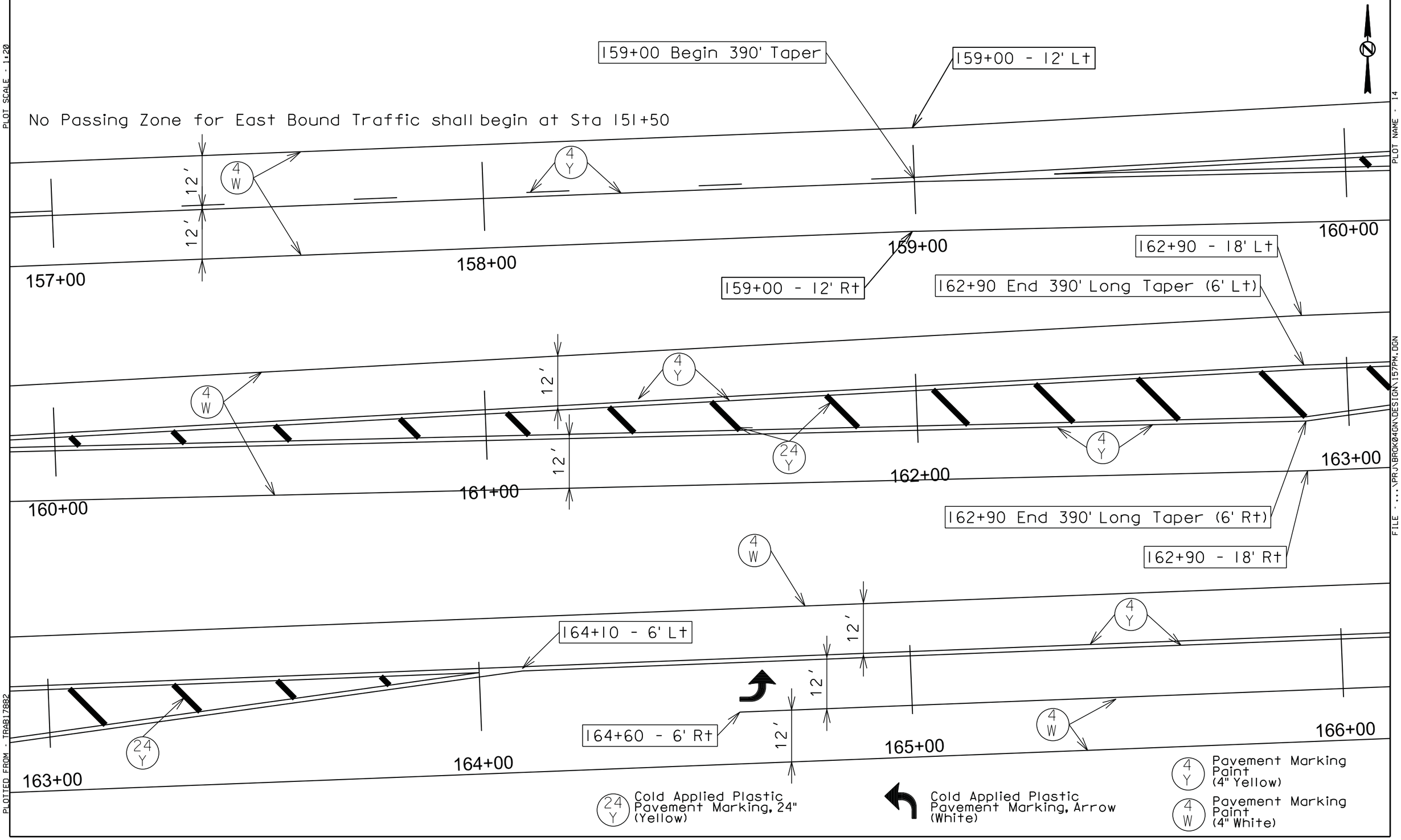
FILE - ...\PRJ\BROK04GN\DESIGN\175.DGN

PLOTTED FROM - TRAB17882

PAVEMENT MARKING LAYOUTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	PH 0014(211)427	30	60

Plotting Date: 03/30/2015



PLOT SCALE - 1:20

PLOT NAME - 14

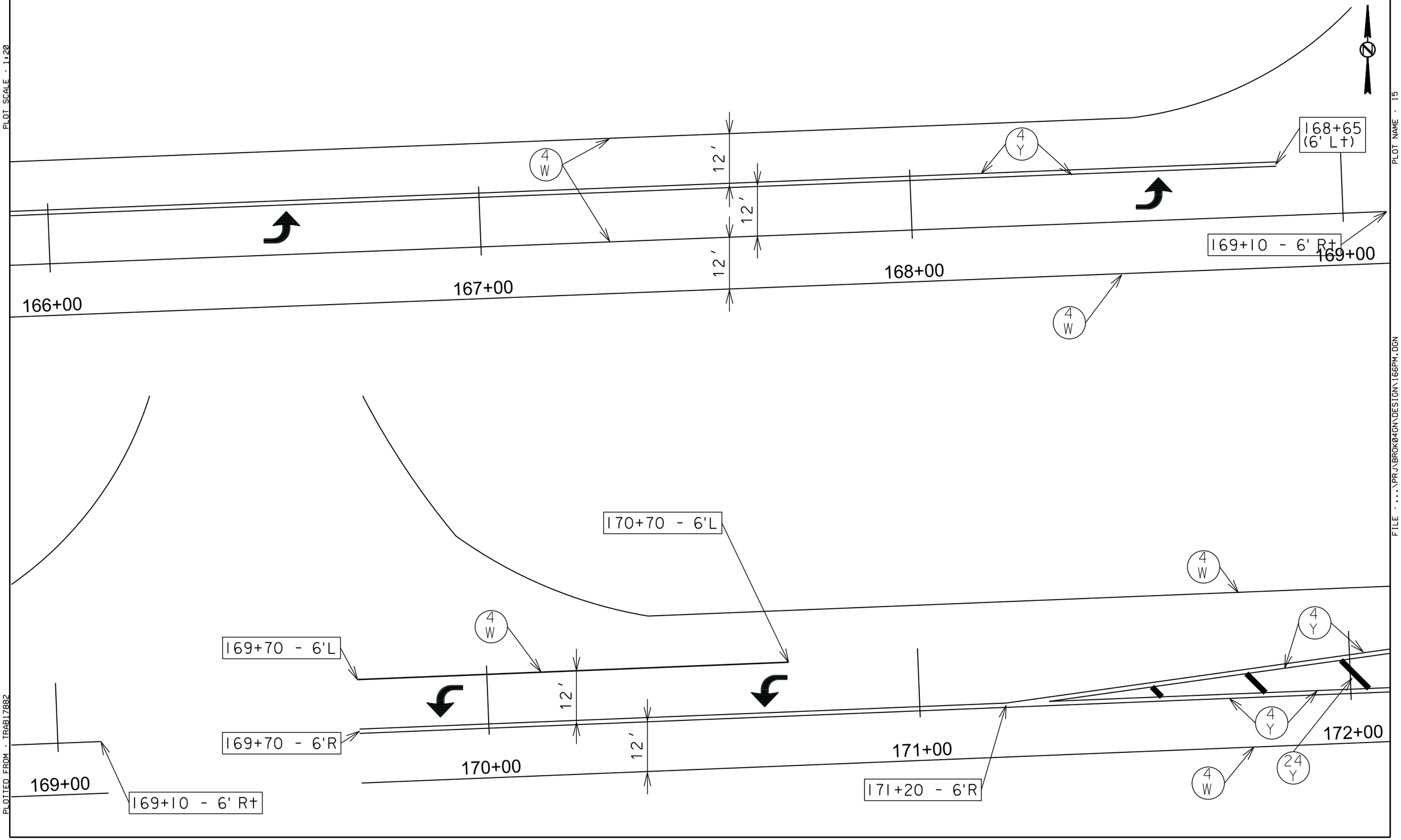
FILE - ...\PRJ\BROK04GN\DESIGN\157PM.DGN

PLOTTED FROM - TRAB17882

PAVEMENT MARKING LAYOUTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	PH 0014(211)427	31	60

Plotting Date: 03/30/2015



PLOT SCALE - 1:20

PLOT NAME - 15

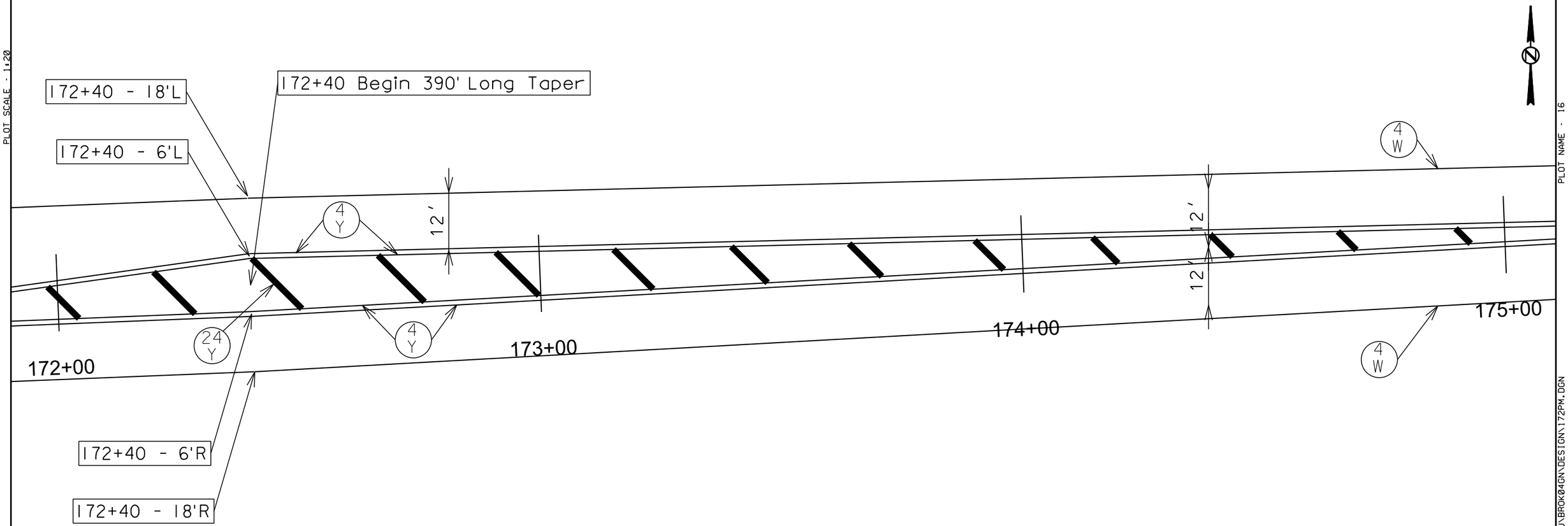
FILE ...\PRJ\BROK04GN\DESIGN\166PM.DGN

PLOTTED FROM - TRAB17982

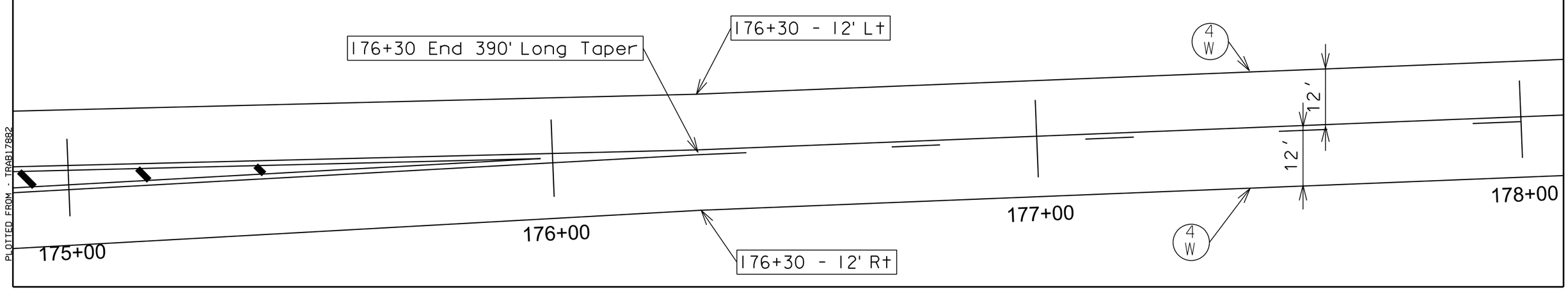
PAVEMENT MARKING LAYOUTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	PH 0014(211)427	32	60

Plotting Date: 03/30/2015



No Passing Zone for West Bound Traffic shall end at Sta 183+80



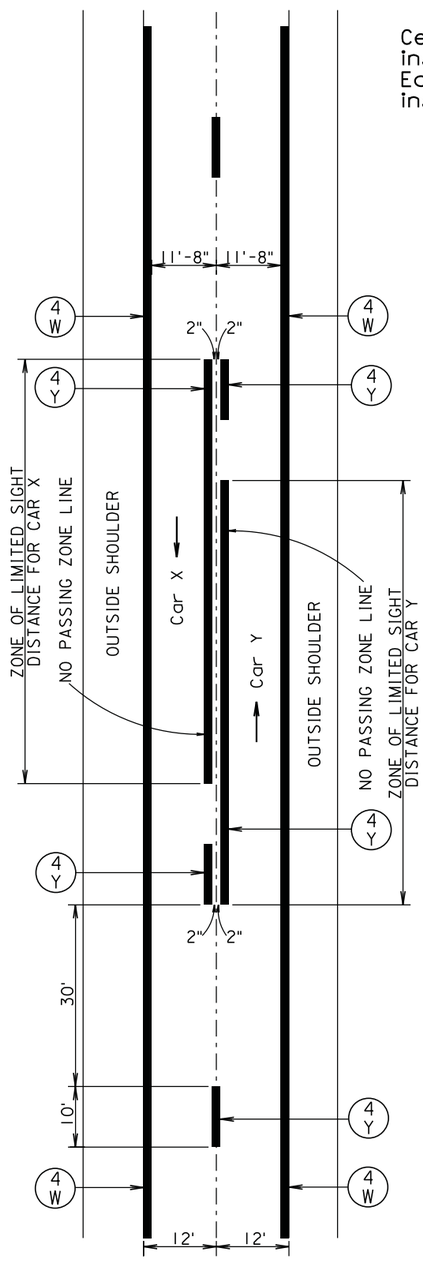
PLOT SCALE - 1:20

PLOT NAME - 16

FILE - ...\PRJ\BROK04GN\DESIGN\172PM.DGN

PLOTTED FROM - TRAB17882

TWO LANE UNDIVIDED ROADWAY



Centerline pavement markings shall be installed between Sta. 151+50 and 183+80. Edgeline pavement markings shall be installed between Sta. 159+00 and 176+30.

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

FURNISHING AND APPLYING PAVEMENT MARKING PAINT

1. The pavement marking paint and glass beads will be furnished and applied by the Contractor. Material shall meet the requirements of Section 980 and 981 of the Specifications.

2. Construction requirements, methods of measurement, and basis of payment shall conform to the requirements of Section 633 of the Specifications.

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

   Undivided Roadway

   Yellow Centerline
   12± Gallons/Pass-Mile
   (Includes No-passing lines)

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

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

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

6. Glass beads shall be applied on the wet paint line at a minimum of eight pounds of glass beads per gallon of paint.

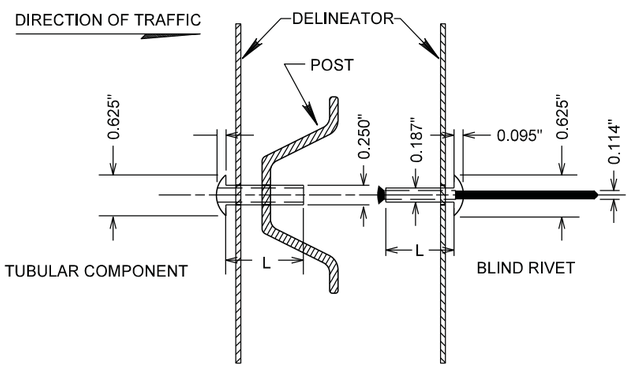
PLOT SCALE - 1:200
PLOTTED FROM - TRAB17882
PLOT NAME - 17
FILE - ...\04GN_PAVEMENT MARKING DETAILS.DGN

DELINEATOR ERECTION DETAILS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	PH 0014(211)427	34	60

Plotting Date: 03/19/2015

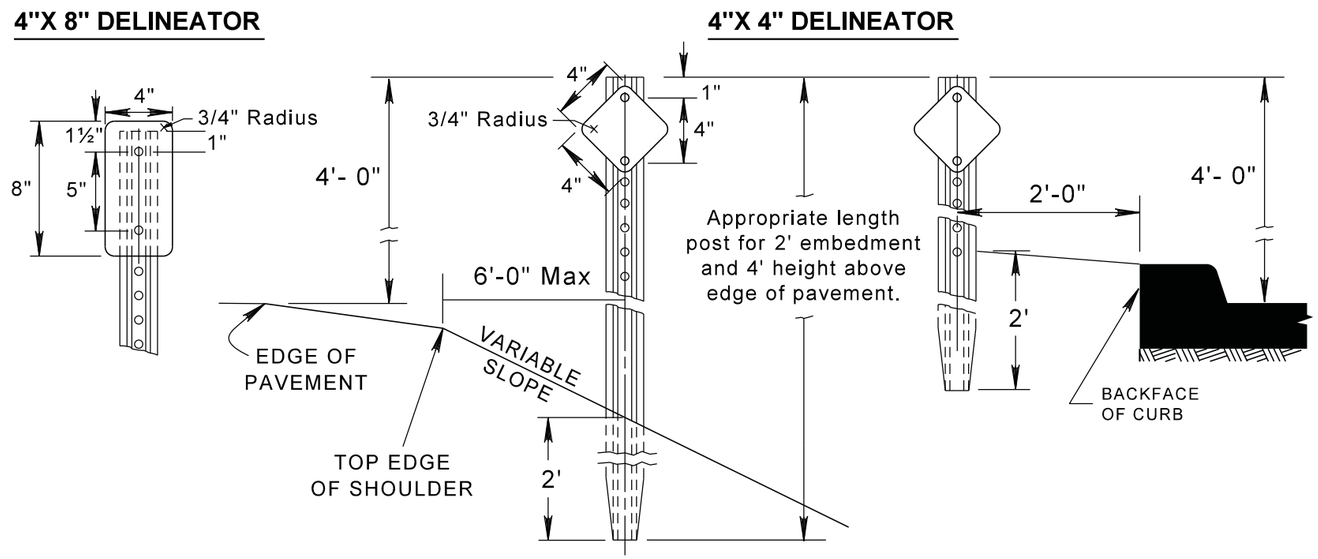
4" X 4" DELINEATORS MOUNTED BACK-TO-BACK



(L)ength varies with Grip Range of Rivet

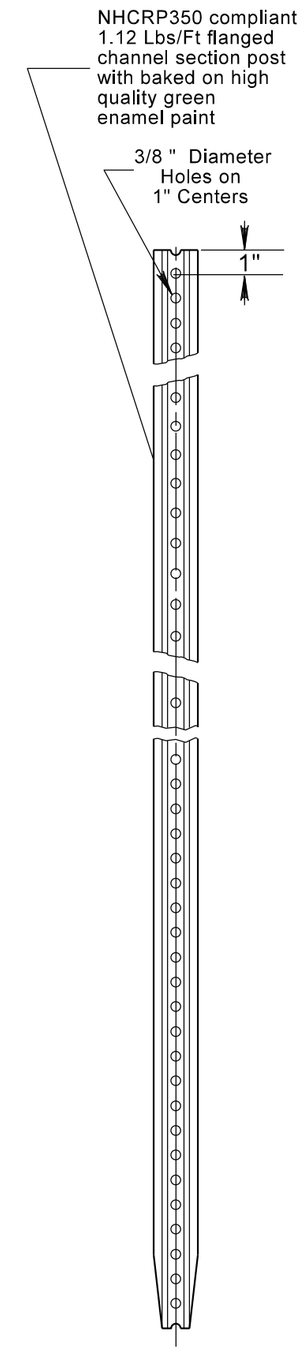
1/4" Two Piece Oval Head Blind Rivet with Aluminum Sleeve, Aluminum Mandrel,and Aluminum Tubular Component is shown. An alternative method of fastening, such as a two piece 3/16 rivet lock bolt, may be used if approved by the Engineer.

4"X 4" and 4"X 8" DELINEATORS



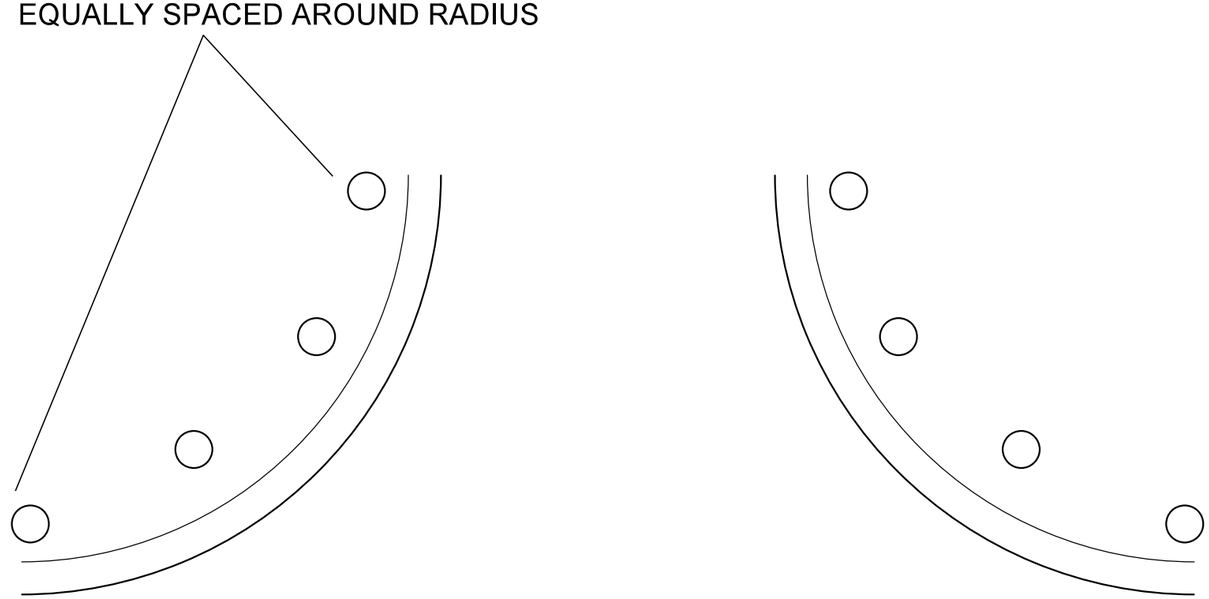
1/4 " Diameter Mounting Holes in all Delineators

POST DETAIL

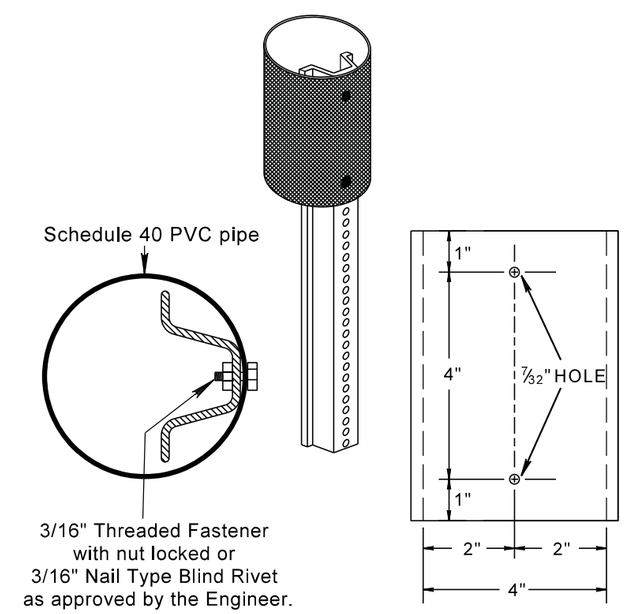


(TYPICAL)

4- 4" DIAMETER TUBULAR DELINEATORS EQUALLY SPACED AROUND RADIUS



4" TUBULAR DELINEATOR MOUNTED ON POST



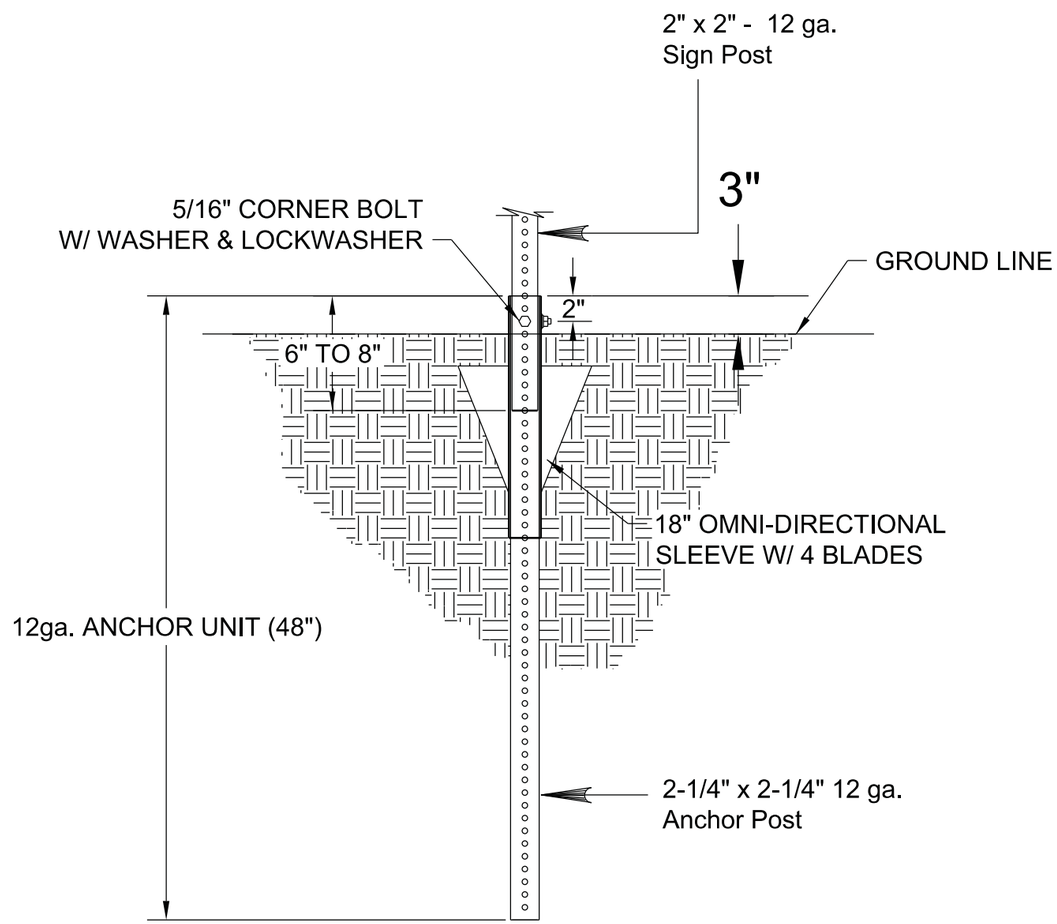
PLOT SCALE - 1:2.78972

PLOTTED FROM - TRAB17892

PLOT NAME - 18

FILE - ...\DESIGN\DELINEATION DETAILS.DGN

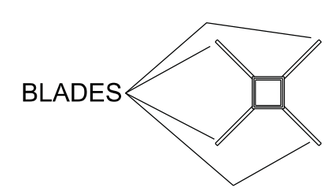
SQUARE TUBE
4 BLADE ANCHOR DETAIL



2-1/2" x 18" OMNI-ANCHOR SLEEVE
FOR SOIL STABILIZATION.

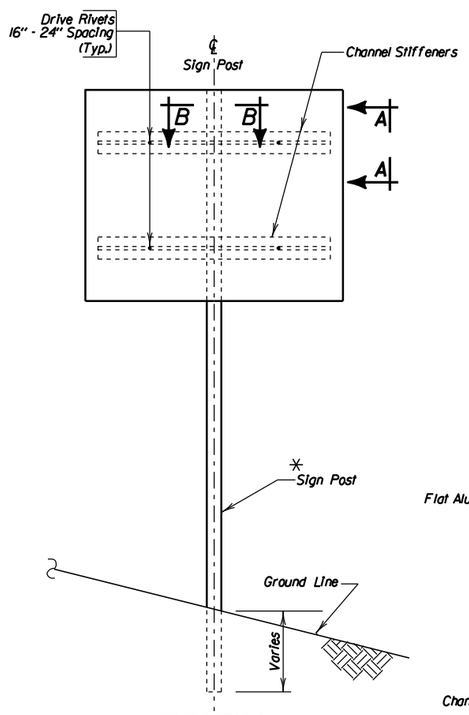
ANCHOR SLEEVE
TOP VIEW

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



PLOT SCALE - 1:200
PLOTTED FROM - TRAB17882
PLOT NAME - 19
FILE - ...\SIGN POST INSTALL DETAILS.DGN

ONE POST BREAKAWAY SIGN SUPPORTS



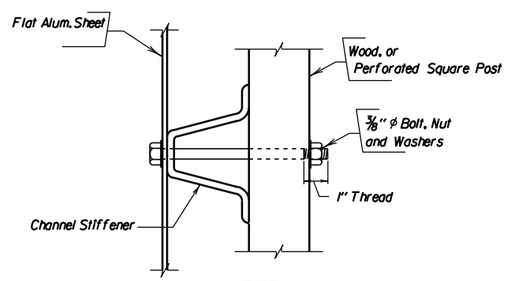
ELEVATION

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

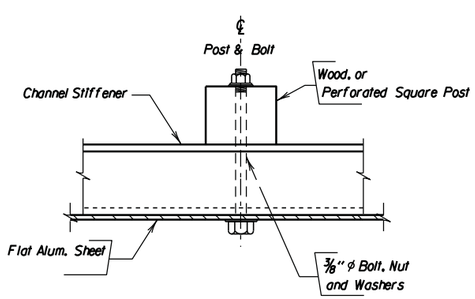
Height and lateral distance as recommended by latest edition of MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

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

(Typical Sign and Stiffener Details)

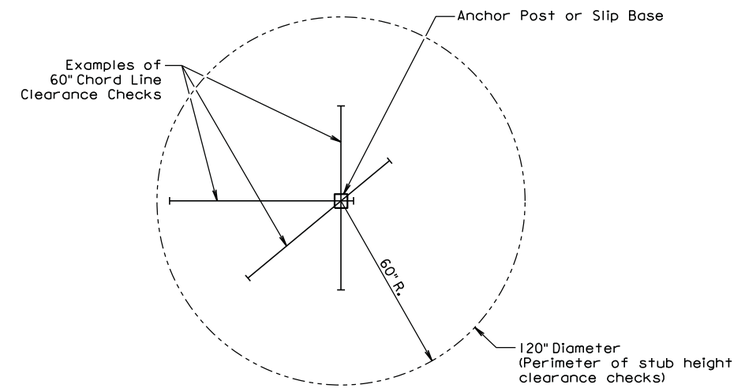


SEC. A-A



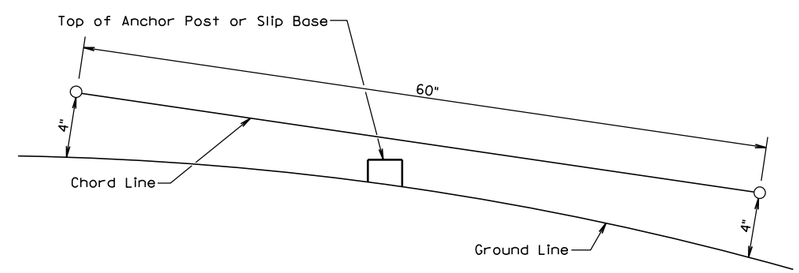
SEC. B-B

BREAKAWAY SUPPORT STUB CLEARANCE



PLAN VIEW

(Examples of stub height clearance checks)



ELEVATION VIEW

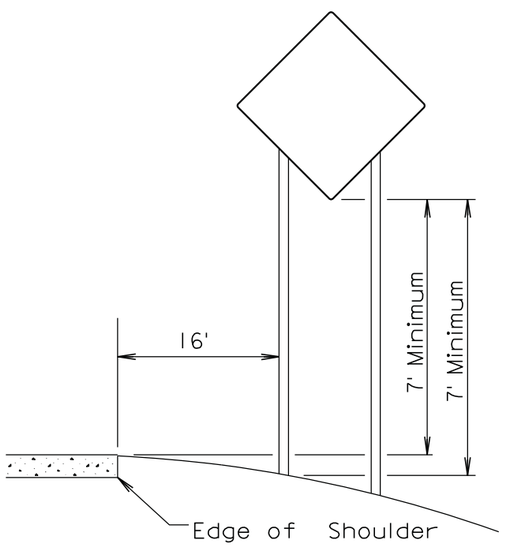
GENERAL NOTES:

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

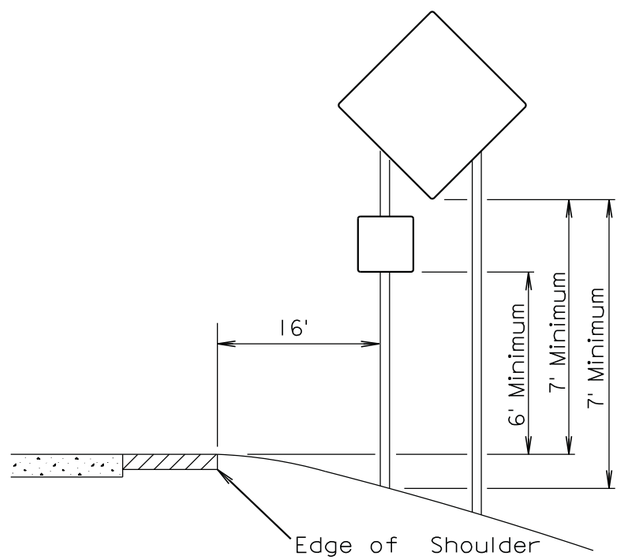
At locations where there is curb and gutter adjacent to the breakaway sign support, the stub height shall be a maximum of 4" above the ground line at the localized area adjacent to the breakaway support stub.

PLOT SCALE - 1:200
PLOT NAME - 20
FILE - ...\SIGN POST INSTALL DETAILS.DGN
PLOTTED FROM - TRAB17892

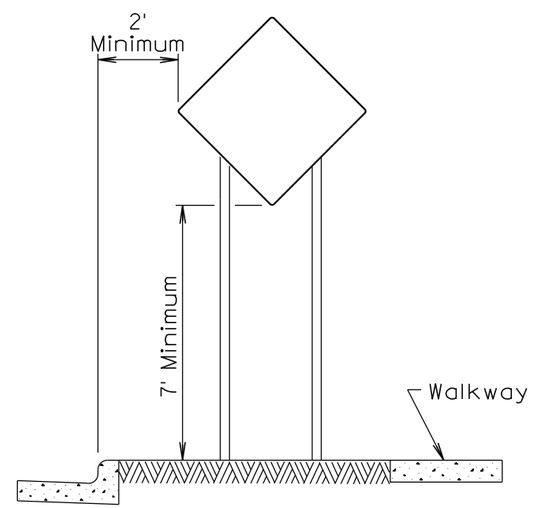
SIGN SUPPORTS
(Lateral Off–Sets)



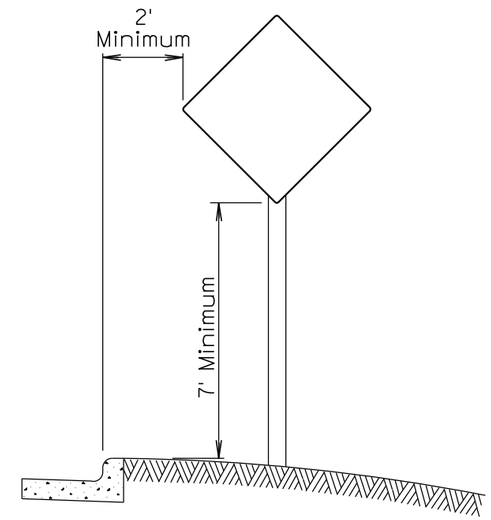
RURAL DISTRICT



RURAL DISTRICT WITH SUPPLEMENTAL PLATE

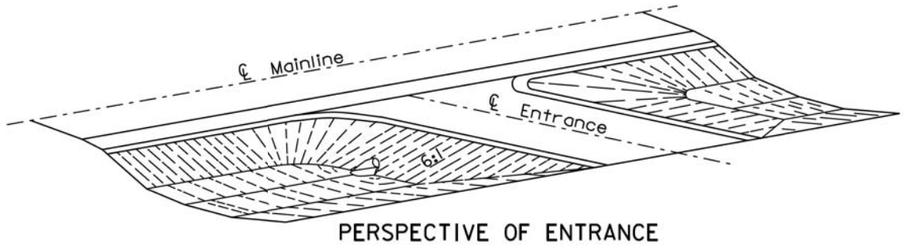


URBAN DISTRICT

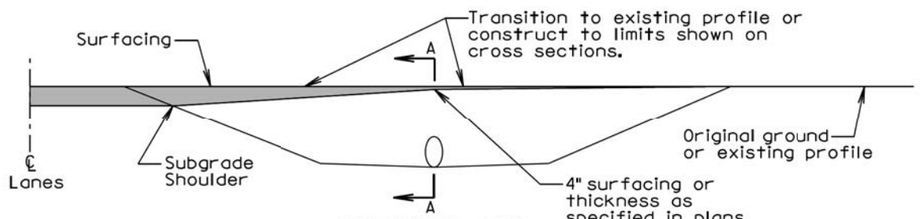


URBAN DISTRICT

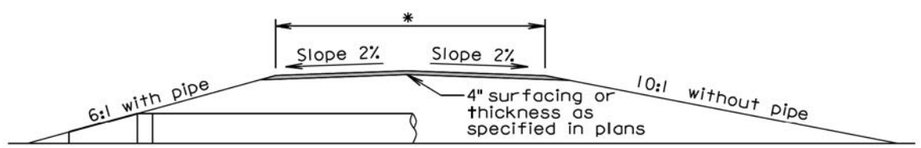
PLOT SCALE - 1:200
PLOTTED FROM - TRAB17982
PLOT NAME - 21
FILE -...\SIGN POST INSTALL DETAILS.DGN



PERSPECTIVE OF ENTRANCE



ELEVATION VIEW (ENTRANCE)



SECTION A-A (ENTRANCE)

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

GENERAL NOTES:

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

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

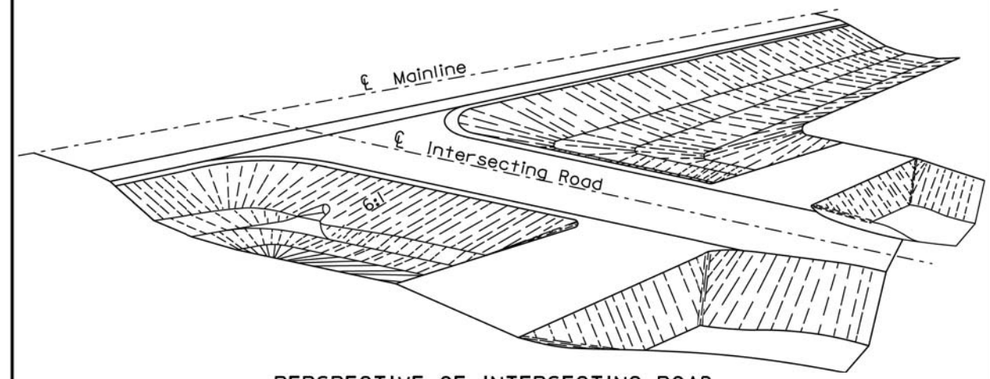
Pipe lengths shall be adjusted if necessary during construction to obtain the 6:1 slopes. For grading projects, the pipe lengths are estimated typically using a 4" thickness of surfacing directly over the subgrade above the pipe.

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

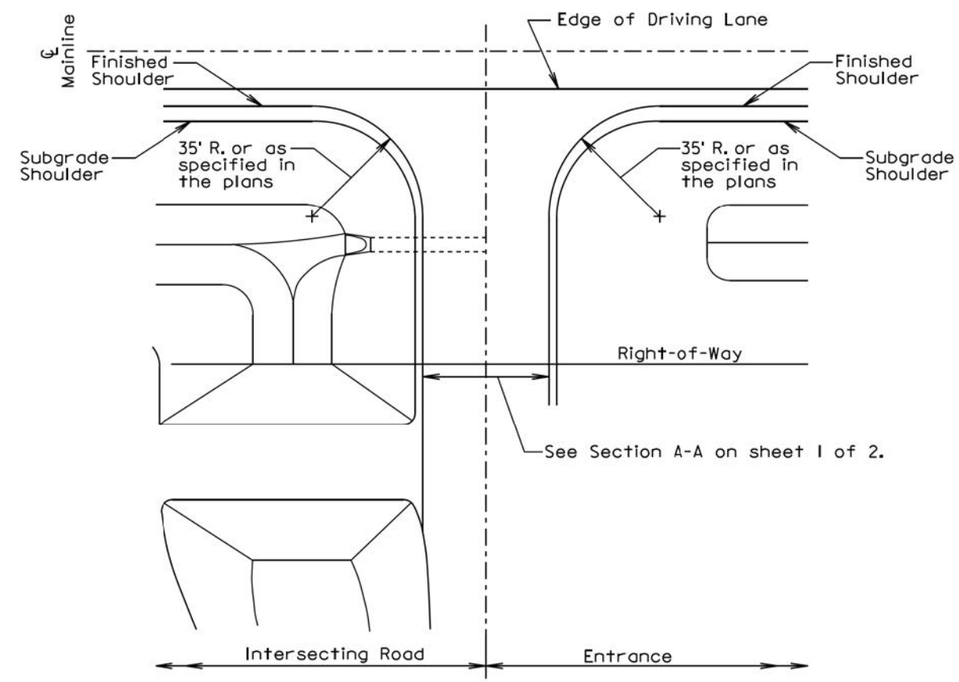
The turning radii shall be 35' for intersecting roads and entrances unless stated otherwise in the plans.

September 6, 2013

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



PERSPECTIVE OF INTERSECTING ROAD

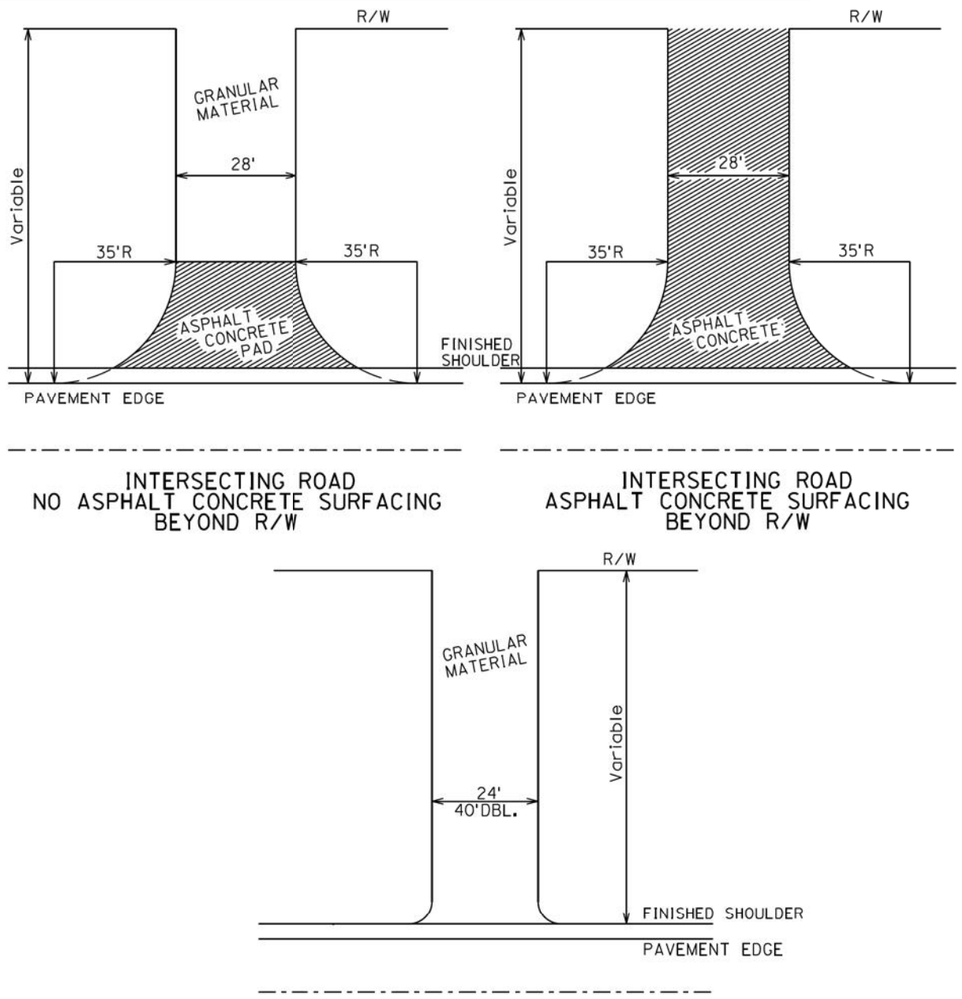


PLAN VIEW

September 6, 2013

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

PLOT SCALE - 1:200
PLOT NAME - 3
FILE - ...\12001_&_12001.DGN
-PLOTTED FROM - TRAB17982



INTERSECTING ROAD
NO ASPHALT CONCRETE SURFACING
BEYOND R/W

INTERSECTING ROAD
ASPHALT CONCRETE SURFACING
BEYOND R/W

ENTRANCE

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

ROADWAY WITH SHOULDER

March 31, 2000

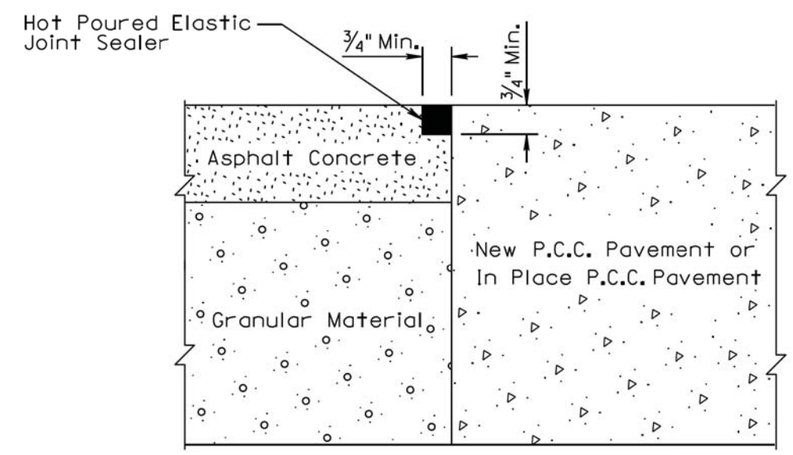
Published Date: 1st Qtr. 2015

SDDOT

SURFACING OF INTERSECTING ROADS AND ENTRANCES

PLATE NUMBER 320.04

Sheet 1 of 1



March 31, 2000

Published Date: 1st Qtr. 2015

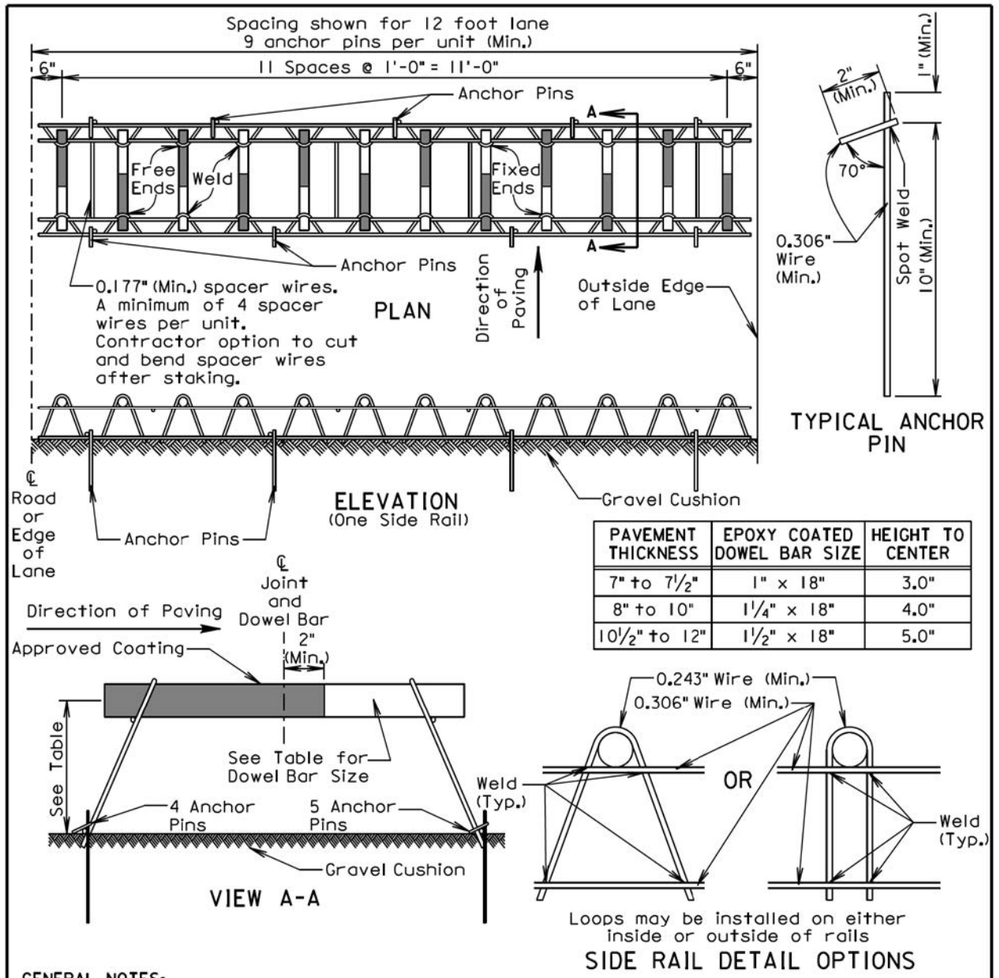
SDDOT

ASPHALT CONCRETE SHOULDER JOINT ADJACENT TO PCC PAVEMENT

PLATE NUMBER 320.15

Sheet 1 of 1

PLOT SCALE - 1:200
PLOTTED FROM - TRAB17882
PLOT NAME - 4
FILE - ...\32004_&_32015.DGN



PAVEMENT THICKNESS	EPOXY COATED DOWEL BAR SIZE	HEIGHT TO CENTER
7" to 7½"	1" x 18"	3.0"
8" to 10"	1¼" x 18"	4.0"
10½" to 12"	1½" x 18"	5.0"

GENERAL NOTES:

Longitudinal joint tie bars shall be placed a minimum of 15 inches from the transverse contraction joint.

Centerline of individual dowel bars shall be parallel to top of subgrade ±1/8 inch in 18 inches and to all other dowel bars in the assembly ±1/16 inch in 18 inches.

Centerline of individual dowel bars shall be parallel to the centerline of the roadway ±1/2 inch in 18 inches.

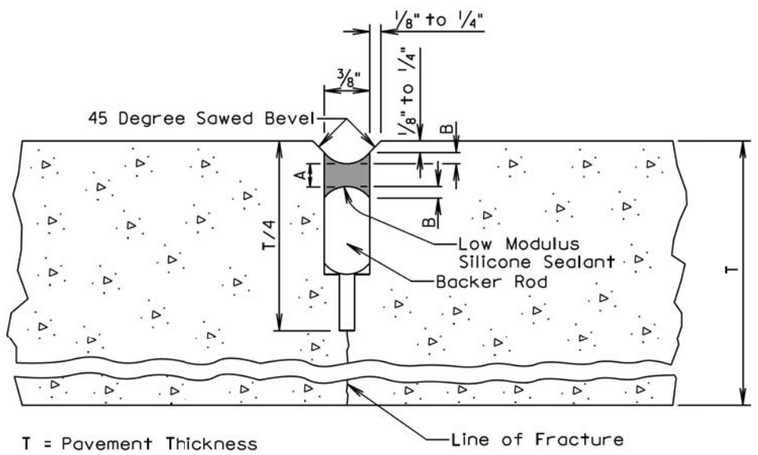
The transverse contraction joints shall be sawed perpendicular to the centerline of the roadway and the dowel bars shall be centered on the sawed joint ±1 inch.

Supporting devices as shown on this sheet, or equivalent as approved by the Engineer, shall be used to maintain proper horizontal and vertical alignment of the dowel bars.

August 30, 2013

Published Date: 1st Qtr. 2015	SDDOT	***PCC PAVEMENT DOWEL BAR ASSEMBLY FOR TRANSVERSE CONTRACTION JOINTS 12 Bar Assembly on Granular Base Material***	*PLATE NUMBER* 380.01
			Sheet 1 of 1

PLOT SCALE - 1:200
PLOT NAME - 5
FILE - ...\38001 & BLANK.DGN
PLOTTED FROM - TRAB17882



LOW MODULUS SILICONE SEALANT ALLOWABLE CONSTRUCTION TOLERANCES			
A (Min.) (In.)	A (Max.) (In.)	B (Min.) (In.)	B (Max.) (In.)
3/16	5/16	1/8	1/4

GENERAL NOTES:

The first saw cut to control cracking shall be a minimum of 1/4 the thickness of the pavement. Additional sawing for widening the saw cut to provide the width for the installation of the low modulus silicone joint sealant will be necessary.

The backer rod shall be a nonmoisture absorbing resilient material approximately 25% larger in diameter than the width of the joint to be sealed.

June 26, 2013

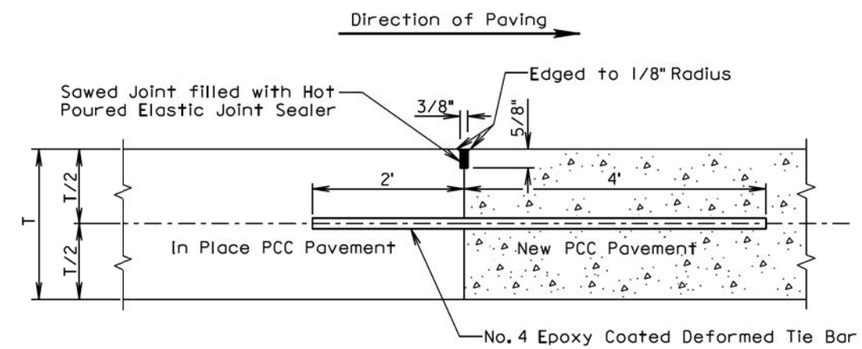
Published Date: 1st Qtr. 2015

SDDOT

PCC PAVEMENT BEVELED TRANSVERSE CONTRACTION JOINT WITH OR WITHOUT DOWEL BAR ASSEMBLY

PLATE NUMBER 380.06

Sheet 1 of 1



GENERAL NOTES:

No. 4 epoxy coated deformed tie bars shall be spaced 12 inches center to center and shall be a minimum of 3 inches and a maximum of 6 inches from the pavement edges.

The minimum distance between a transverse construction joint with tie bars and an adjacent transverse contraction joint shall be 5 feet.

When a transverse construction joint is made, paving will not be allowed in this area for 12 hours.

A transverse construction joint may be placed in lieu of the transverse contraction joint when shown in the plans.

The term "In Place PCC Pavement" in the above drawing indicates that the in place PCC pavement was placed on the current project.

June 26, 2013

Published Date: 1st Qtr. 2015

SDDOT

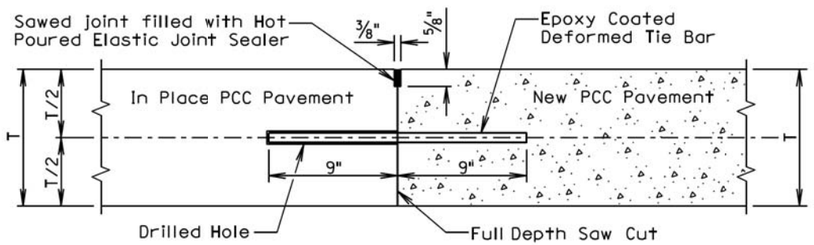
PCC PAVEMENT MID PANEL TRANSVERSE CONSTRUCTION JOINT

PLATE NUMBER 380.07

Sheet 1 of 1

PLOT SCALE - 1:200
PLOT NAME - 6
FILE - ...\38006_&_38007.DGN
PLOTTED FROM - TRAB17882

DETAIL A
TRANSVERSE CONSTRUCTION JOINT WITH TIE BARS



T = In Place PCC Pavement and New PCC Pavement Thickness

GENERAL NOTES:

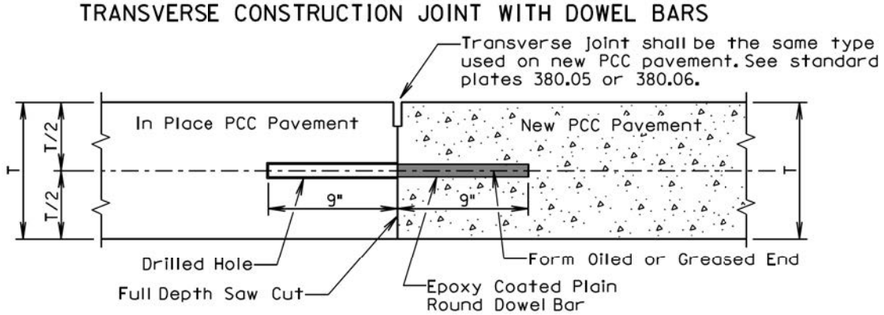
The term "In Place PCC Pavement" in the above drawing indicates that the in place PCC pavement was placed on a previous project.

See sheet 2 of 2 of this standard plate to determine if Detail A shall be used.

The tie bars shall be embedded a minimum depth of 9 inches into the in place PCC pavement and anchored with an epoxy resin adhesive.

No. 9 epoxy coated deformed tie bars shall be used in 10 inch thickness and less PCC Pavement and No. 11 epoxy coated deformed tie bars shall be used in 10.5 inch thickness and greater PCC Pavement. The tie bar spacing shall be 18 inches center to center and shall be a minimum of 3 inches and a maximum of 9 inches from the pavement edges.

DETAIL B
TRANSVERSE CONSTRUCTION JOINT WITH DOWEL BARS



T = In Place PCC Pavement and New PCC Pavement Thickness

GENERAL NOTES:

The term "In Place PCC Pavement" in the above drawing indicates that the in place PCC pavement was placed on a previous project or current project.

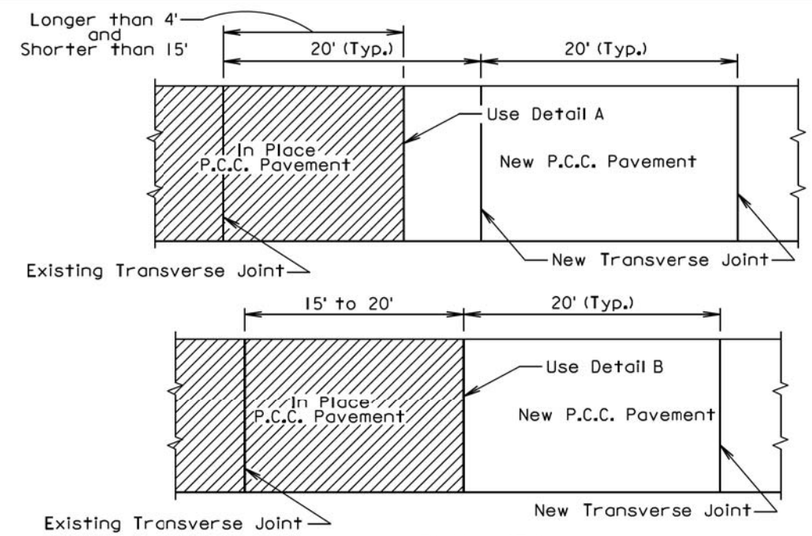
See sheet 2 of 2 of this standard plate to determine if Detail B shall be used.

The plain round dowel bars shall be embedded a minimum depth of 9 inches into the in place PCC pavement and anchored with an epoxy resin adhesive.

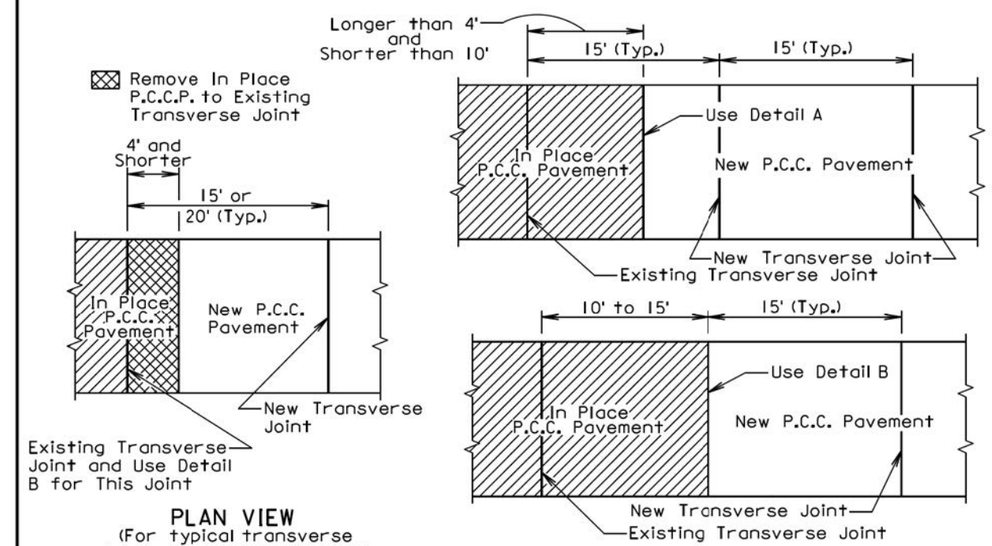
The epoxy coated plain round dowel bar size, number, and spacing shall be the same as detailed on the corresponding dowel bar assembly standard plate (380.01, 380.02, 380.03, or 380.04). The epoxy coated plain round dowel bars shall be a minimum of 3 inches and a maximum of 6 inches from the pavement edges.

September 6, 2013

Published Date: 1st Qtr. 2015	SDDOT	PCC PAVEMENT TRANSVERSE CONSTRUCTION JOINTS WITH TIE BARS OR DOWEL BARS	PLATE NUMBER 380.08
			Sheet 1 of 2



PLAN VIEW
(For typical transverse joint spacing of 20' on the current project)



PLAN VIEW
(For typical transverse joint spacing of 15' or 20' on the current project)

PLAN VIEW
(For typical transverse joint spacing of 15' on the current project)

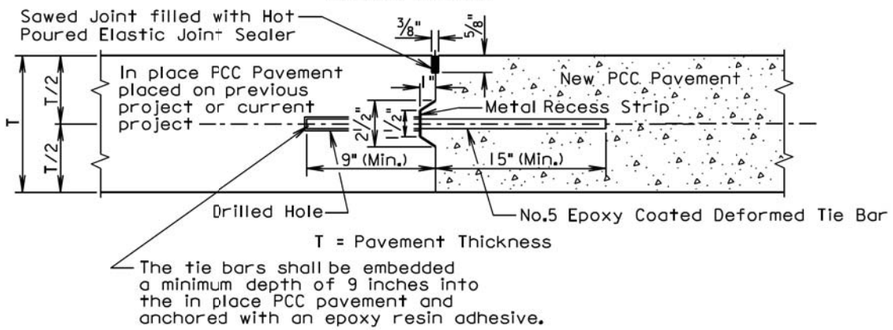
September 6, 2013

Published Date: 1st Qtr. 2015	SDDOT	PCC PAVEMENT TRANSVERSE CONSTRUCTION JOINTS WITH TIE BARS OR DOWEL BARS	PLATE NUMBER 380.08
			Sheet 2 of 2

PLOT SCALE - 1:200
PLOT NAME - 7
FILE - ...\380008_&_380008.DGN
PLOTTED FROM - TRAB17882

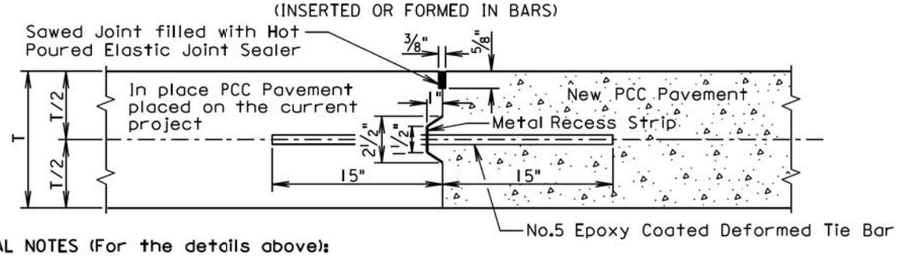
LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS

(DRILLED IN BARS)



LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS

(INSERTED OR FORMED IN BARS)



GENERAL NOTES (For the details above):

The epoxy coated deformed tie bars shall be spaced in accordance with the following tables:

Tie Bar Spacing 48" Maximum	
Transverse Contraction Joint Spacing	Number of Tie Bars
6.5' to 10'	2
10.5' to 14'	3
14.5' to 18'	4
18.5' to 22'	5

Tie Bar Spacing 30" Maximum	
Transverse Contraction Joint Spacing	Number of Tie Bars
5' to 7'	2
7.5' to 9.5'	3
10' to 12'	4
12.5' to 14.5'	5
15' to 17'	6
17.5' to 19.5'	7
20' to 22'	8

The tie bars shall be placed a minimum of 15 inches from transverse contraction joints.

The required number of tie bars as shown in the table shall be uniformly spaced within each panel. The uniformly spaced tie bars shall be spaced a maximum of 48 inches center to center for a female keyway and shall be spaced a maximum of 30 inches center to center for a vertical face and male keyway. The maximum tie bar spacing shall apply to tie bars within each panel.

The keyway illustrated in the above details depict a female keyway.

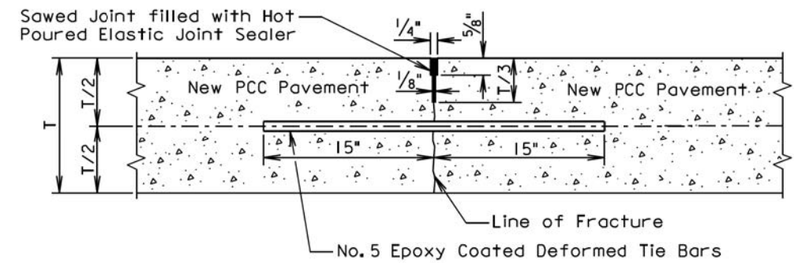
The keyway is optional and is not required. When concrete pavement is formed and a keyway is provided, a metal recess strip shall be used. When concrete pavement is slip formed, a metal recess strip is not required.

August 31, 2013

Published Date: 1st Qtr. 2015	SDDOT	PCC PAVEMENT LONGITUDINAL JOINTS WITH TIE BARS	PLATE NUMBER 380.10
			Sheet 1 of 2

SAWED LONGITUDINAL JOINT WITH TIE BARS

(POURED MONOLITHICALLY)



T = Pavement Thickness

GENERAL NOTES (For the detail above):

The epoxy coated deformed tie bars shall be spaced in accordance with the following table:

Tie Bar Spacing 48" Maximum	
Transverse Contraction Joint Spacing	Number of Tie Bars
6.5' to 10'	2
10.5' to 14'	3
14.5' to 18'	4
18.5' to 22'	5

The tie bars shall be placed a minimum of 15 inches from the transverse contraction joints.

The required number of tie bars as shown in the table shall be uniformly spaced within each panel with a maximum space of 48 inches center to center. The maximum tie bar spacing shall apply to tie bars within each panel.

The first saw cut to control cracking shall be a minimum of 1/3 the thickness of the pavement. Additional sawing for widening the saw cut to provide the width for the installation of the hot poured elastic joint sealer is necessary.

August 31, 2013

Published Date: 1st Qtr. 2015	SDDOT	PCC PAVEMENT LONGITUDINAL JOINTS WITH TIE BARS	PLATE NUMBER 380.10
			Sheet 2 of 2

PLOT SCALE - 1:200
PLOT NAME - 8
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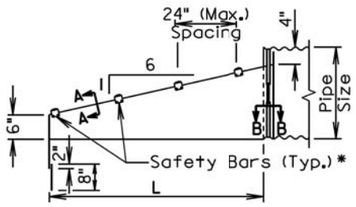
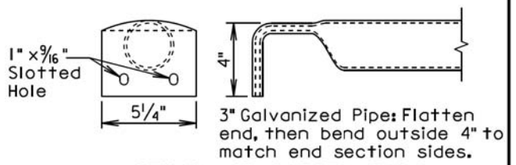
PLOTTED FROM - TRAB17892

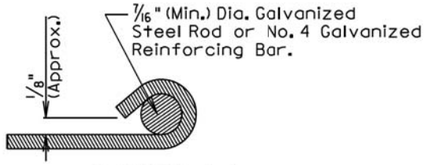


ELEVATION VIEW

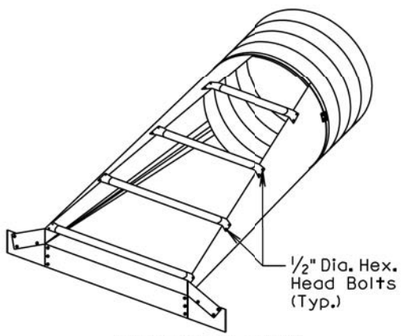
*Number of bars required will vary depending on the length of the end section.



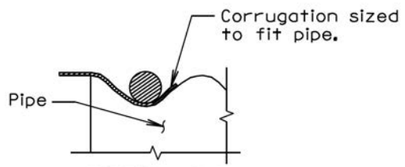
DETAIL OF SAFETY BARS



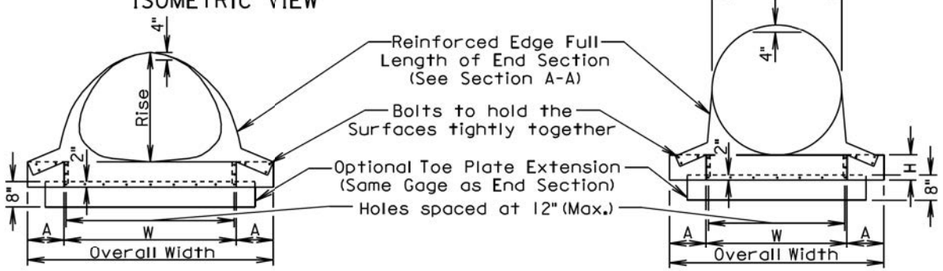
SECTION A-A



ISOMETRIC VIEW

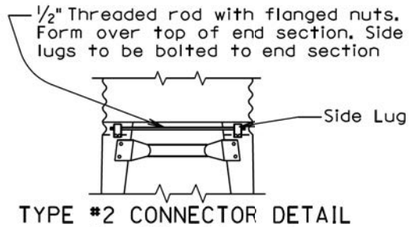


SECTION B-B

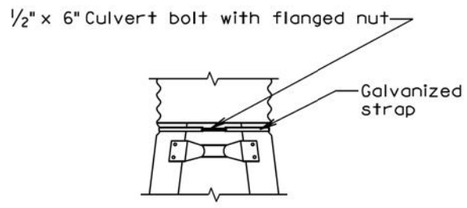


FRONT VIEW

FRONT VIEW



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



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

August 31, 2013

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

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

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

GENERAL NOTES:

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

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

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

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

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

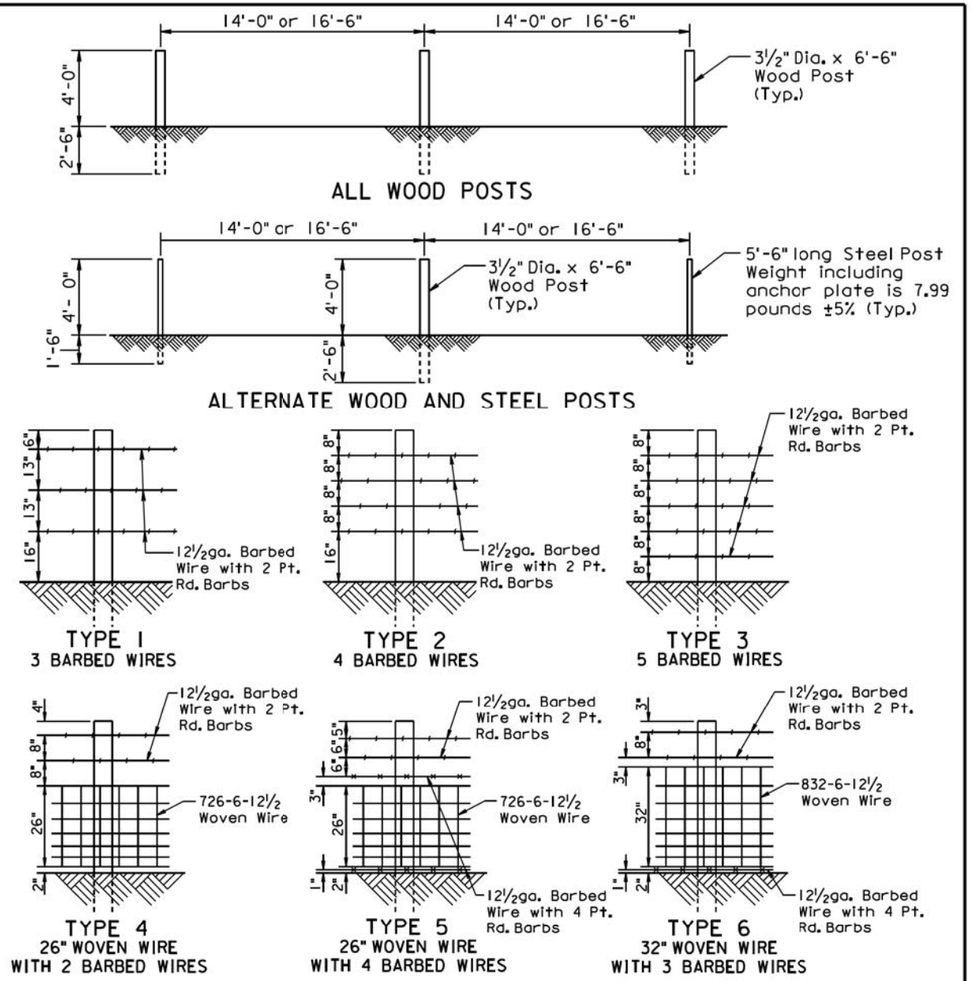
Installation shall be performed in accordance with the Standard Specifications.

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

August 31, 2013

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

PLOT SCALE - 1:200
PLOT NAME - 9
FILE - ...\45038_&_45038.DGN
PLOTTED FROM - TRAB17982



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

GENERAL NOTES:

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

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

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

September 14, 2009

Published Date: 1st Qtr. 2015

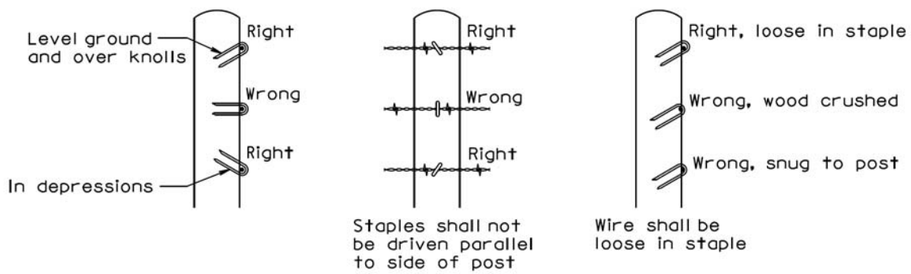
SDDOT

RIGHT-OF-WAY FENCE

PLATE NUMBER
620.01

Sheet 1 of 1

PLOT SCALE - 1:200
PLOT NAME - 10
FILE - ...\62001_&_BLANK.DGN
PLOTTED FROM - TRAB17882



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.

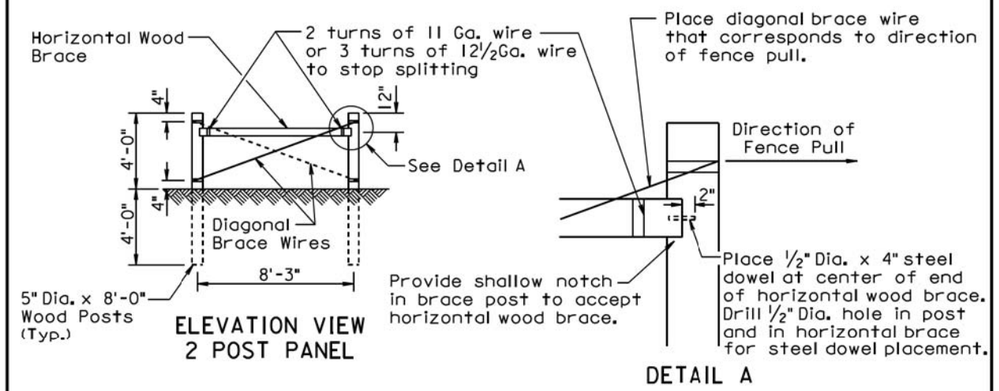
Right-of-Way fence other than on Interstate Projects shall be constructed within one foot of the Right-of-Way on the Landowner's side except at bridge openings, cattle passes, and as otherwise directed by the Engineer.

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.

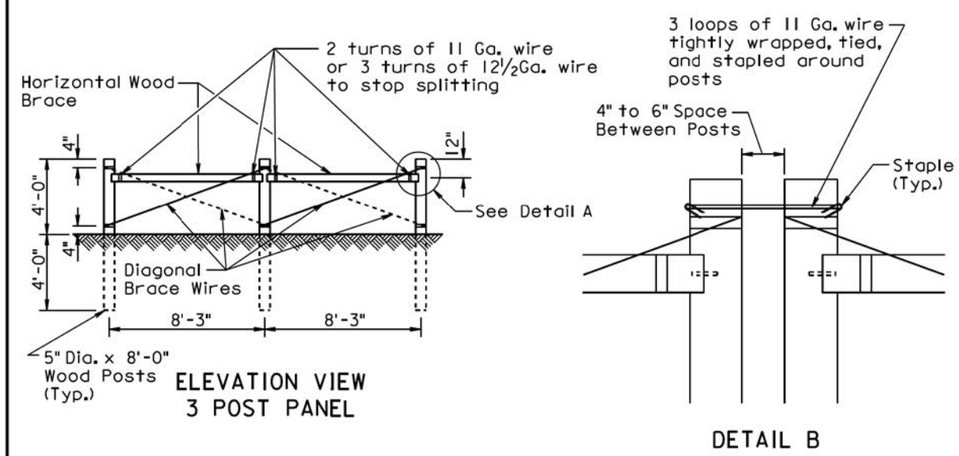
December 23, 2004

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

PLOT SCALE - 1:200
PLOT NAME - 11
FILE - ...\62002_&_62003.DGN
PLOTTED FROM - TRAB17882

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.

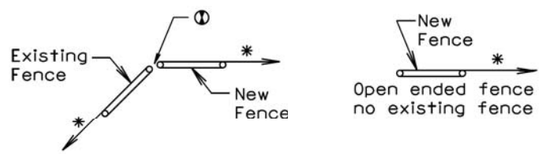
GENERAL NOTE:

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

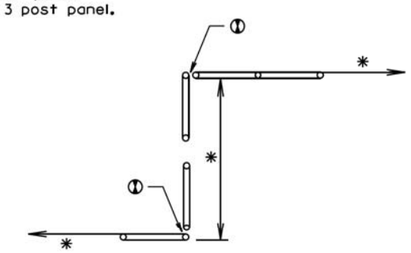
* If fence length is less than 600' to next corner use a 2 post panel.
If fence length is greater than 600' to next corner use a 3 post panel.

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

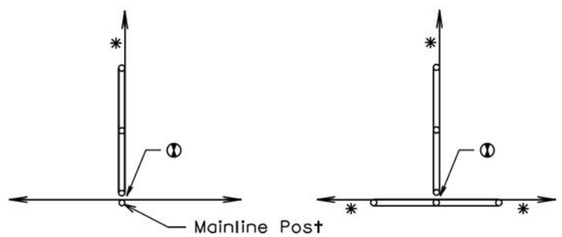
① See Detail B on Sheet 1 of 3.



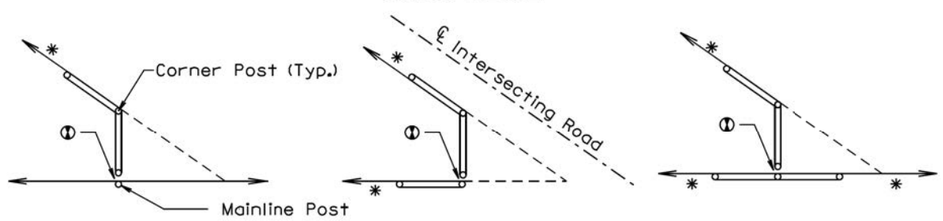
BEGIN OR END FENCE
(where new fence ties into existing fence)



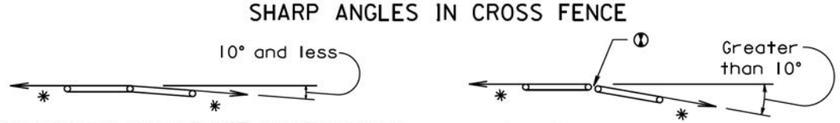
SHORT JOGS IN FENCE



CROSS FENCE



SHARP ANGLES IN CROSS FENCE



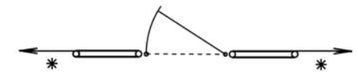
Additional fence panel is NOT required when an angle in the mainline fence is 10° and less.

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

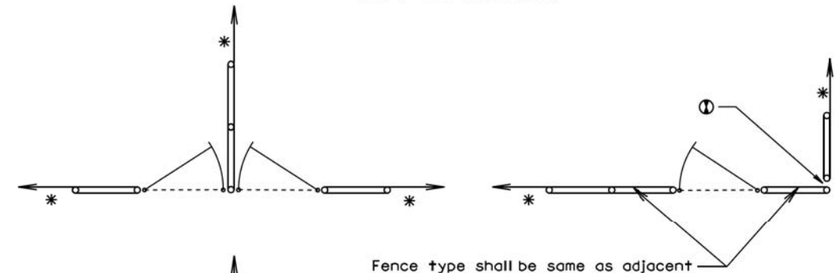
ANGLES IN MAINLINE FENCE

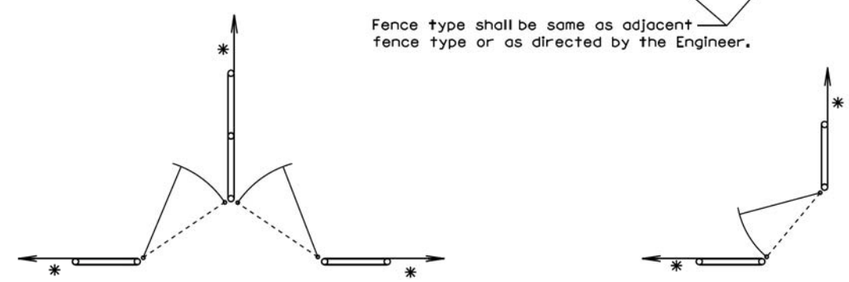
December 23, 2004

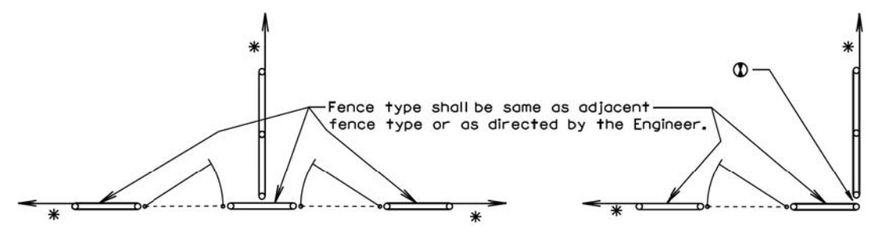
Published Date: 1st Qtr. 2015	SDDOT	BRACE PANELS AND APPLICATIONS OF BRACE PANELS	PLATE NUMBER 620.03
			Sheet 2 of 3



ENTRANCE
(NOT ON CORNER)







DOUBLE ENTRANCES

ENTRANCES AT CORNERS

GATES

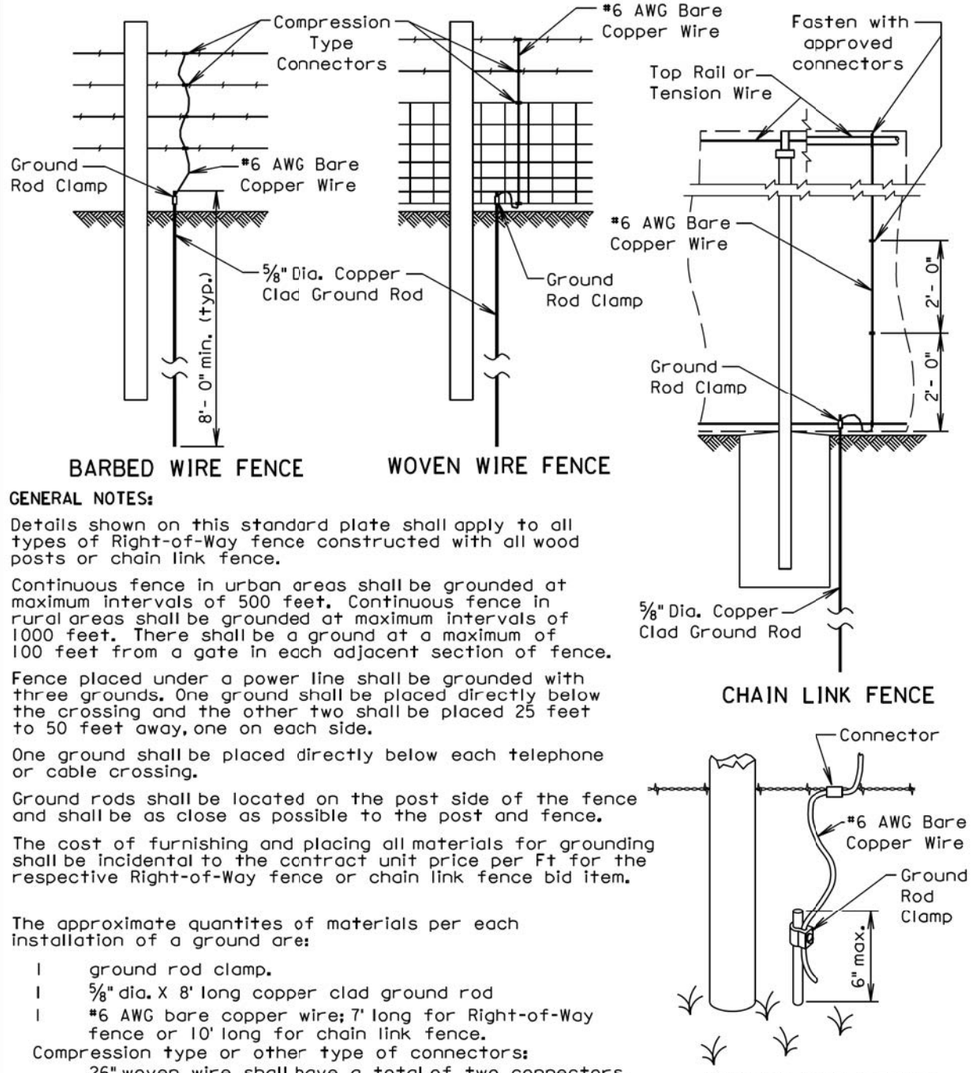
* If fence length is less than 600' to next corner use a 2 post panel.
If fence length is greater than 600' to next corner use a 3 post panel.

① See Detail B on Sheet 1 of 3.

December 23, 2004

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

PLOT SCALE - 1:200
PLOT NAME - 12
FILE - ...\G2003_&_G2003.DGN
PLOTTED FROM - TRAB17892



GENERAL NOTES:

Details shown on this standard plate shall apply to all types of Right-of-Way fence constructed with all wood posts or chain link fence.

Continuous fence in urban areas shall be grounded at maximum intervals of 500 feet. Continuous fence in rural areas shall be grounded at maximum intervals of 1000 feet. There shall be a ground at a maximum of 100 feet from a gate in each adjacent section of fence.

Fence placed under a power line shall be grounded with three grounds. One ground shall be placed directly below the crossing and the other two shall be placed 25 feet to 50 feet away, one on each side.

One ground shall be placed directly below each telephone or cable crossing.

Ground rods shall be located on the post side of the fence and shall be as close as possible to the post and fence.

The cost of furnishing and placing all materials for grounding shall be incidental to the contract unit price per Ft for the respective Right-of-Way fence or chain link fence bid item.

The approximate quantites of materials per each installation of a ground are:

- 1 ground rod clamp.
- 1 5/8" dia. X 8' long copper clad ground rod
- 1 #6 AWG bare copper wire; 7' long for Right-of-Way fence or 10' long for chain link fence.

Compression type or other type of connectors:

26" woven wire shall have a total of two connectors, one secured to the top and one secured to the bottom.

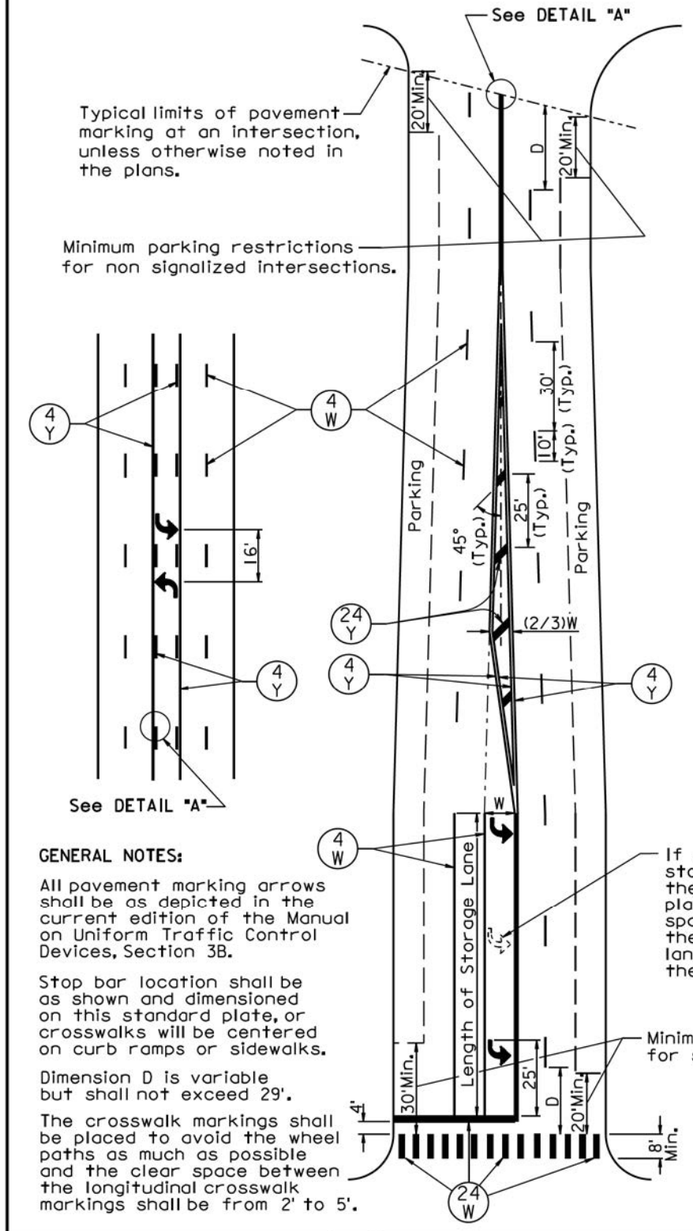
32" woven wire shall have a total of three connectors, one secured to the top, one secured to the middle, and one secured to the bottom.

One connector shall be used for each strand of barbed wire.

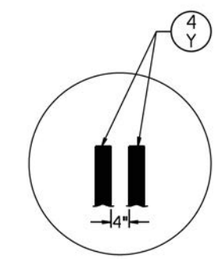
A minimum of 3 connectors shall be installed on chain link fence, the connectors shall be placed vertically at every two foot increment and connectors shall be placed on the top and bottom tension wires or top rail.

March 31, 2000

Published Date: 1st Qtr. 2015	SDDOT	FENCE GROUNDING	PLATE NUMBER 620.11
			Sheet 1 of 1



KEY	ITEM
4 W	4" White
4 Y	4" Yellow
12 W	12" White
24 W	24" White
24 Y	24" Yellow
↱	Arrow



DETAIL "A"

GENERAL NOTES:

All pavement marking arrows shall be as depicted in the current edition of the Manual on Uniform Traffic Control Devices, Section 3B.

Stop bar location shall be as shown and dimensioned on this standard plate, or crosswalks will be centered on curb ramps or sidewalks.

Dimension D is variable but shall not exceed 29'.

The crosswalk markings shall be placed to avoid the wheel paths as much as possible and the clear space between the longitudinal crosswalk markings shall be from 2' to 5'.

If more than 2 arrows per storage lane are shown, then the additional arrows shall be placed at approximately equal spaces between the arrow at the beginning of the storage lane and the arrow nearest the stop bar.

Minimum parking restrictions for signalized intersections.

September 14, 2011

Published Date: 1st Qtr. 2015	SDDOT	PAVEMENT MARKINGS FOR ADJACENT INTERSECTIONS AND CENTER TURN LANE	PLATE NUMBER 633.01
			Sheet 1 of 1

PLOT SCALE - 1:200
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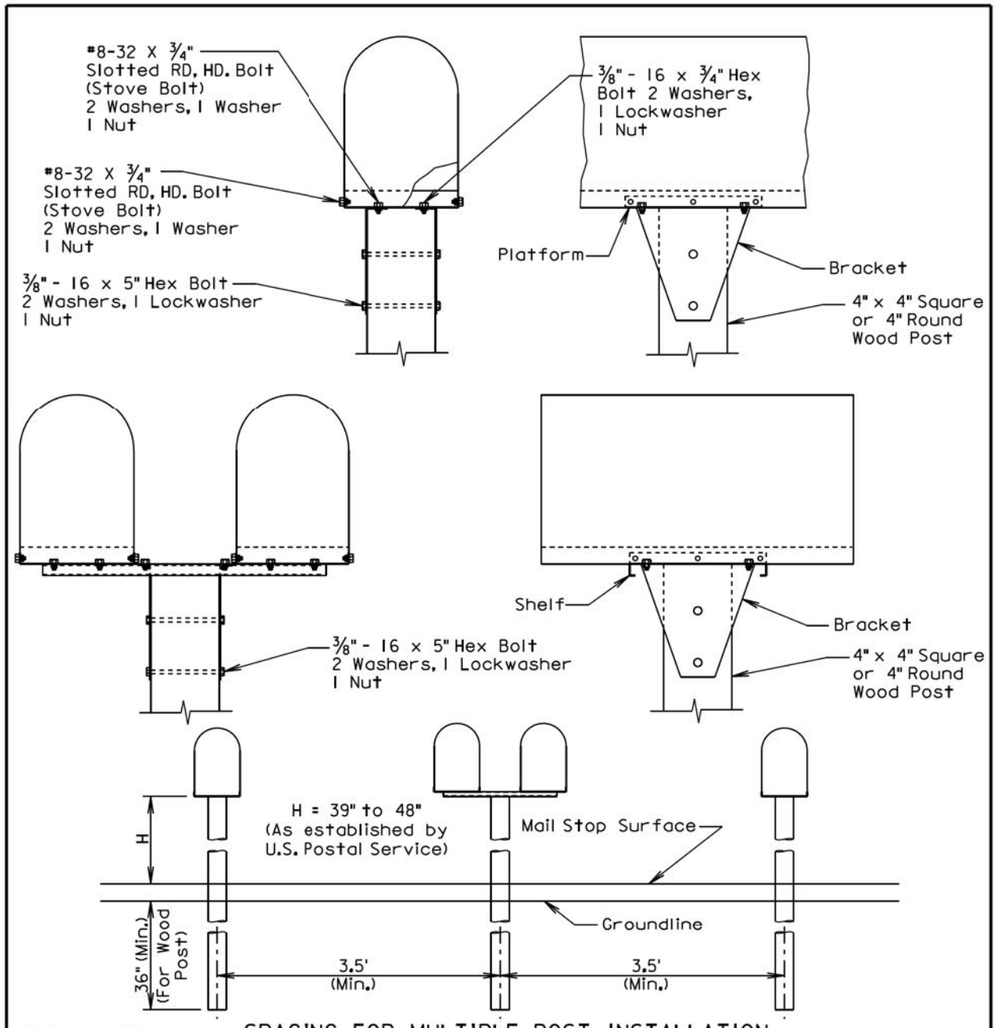


SPACING FOR MULTIPLE POST INSTALLATION

GENERAL NOTES:

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

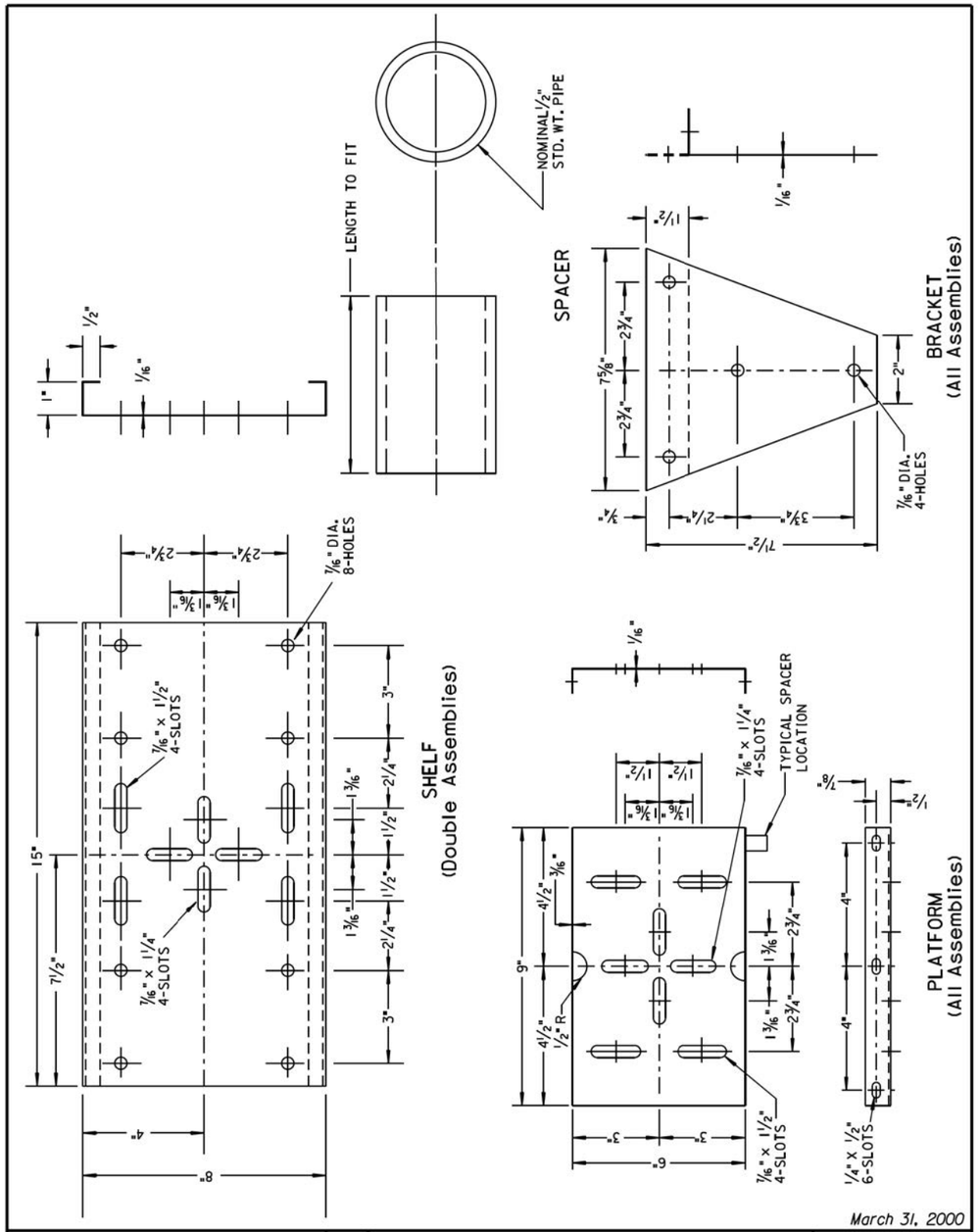
Single and double mailboxes may be in any sequence.

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

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

September 6, 2013

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



March 31, 2000

Published Date: 1st Qtr. 2015	SDDOT	MAILBOX SUPPORT HARDWARE	PLATE NUMBER 900.03
			Sheet 1 of 1

PLOT SCALE - 1:200
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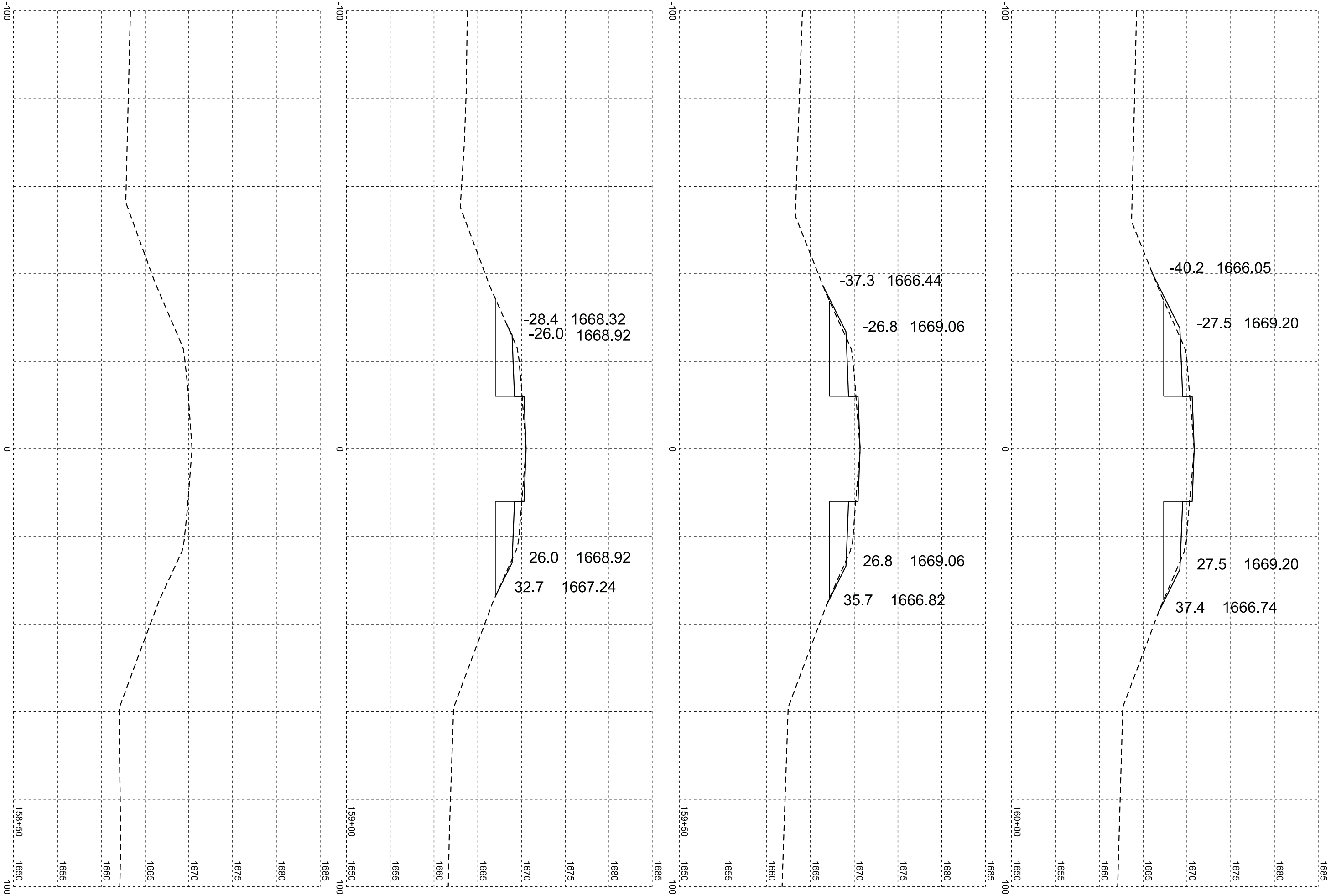

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
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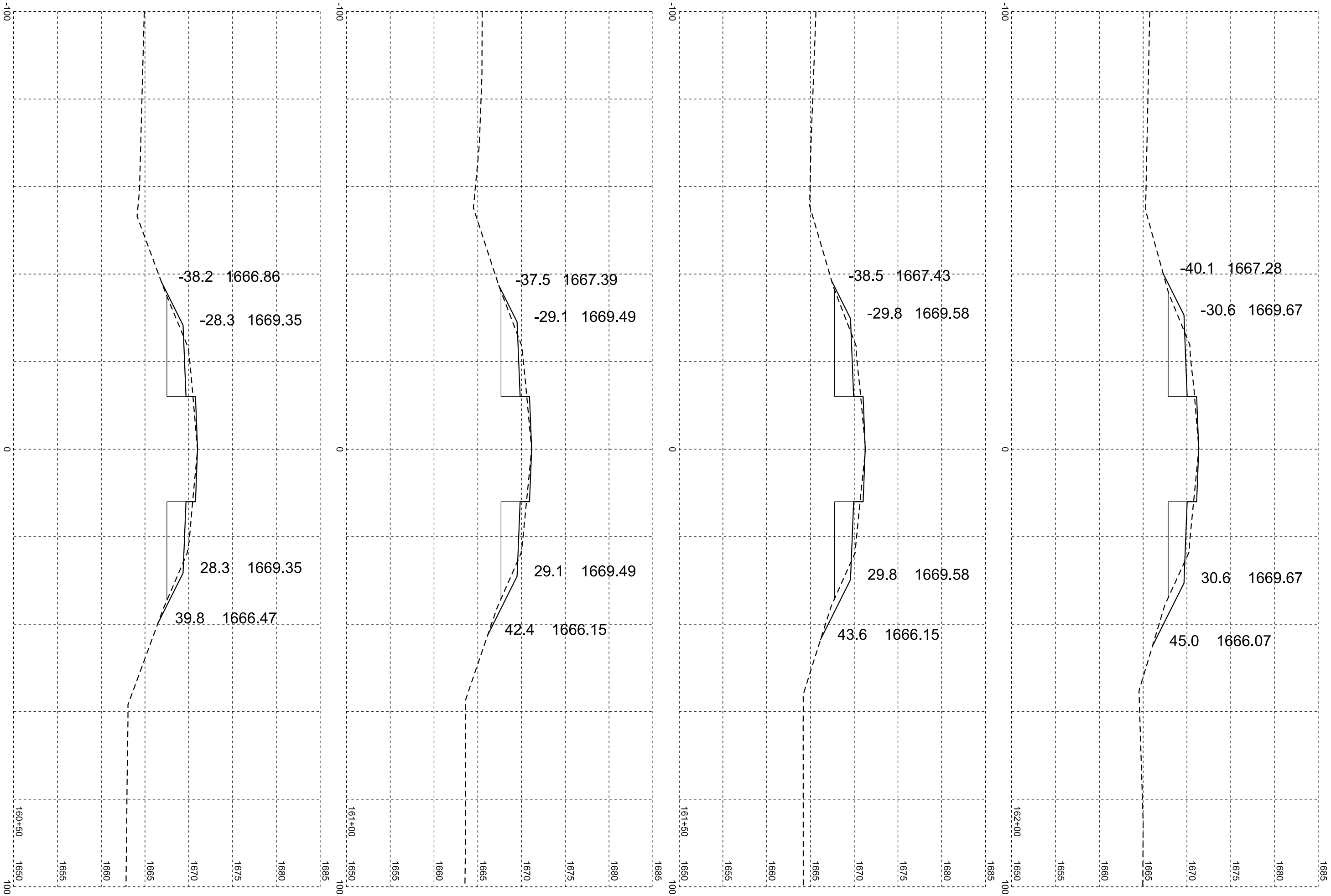

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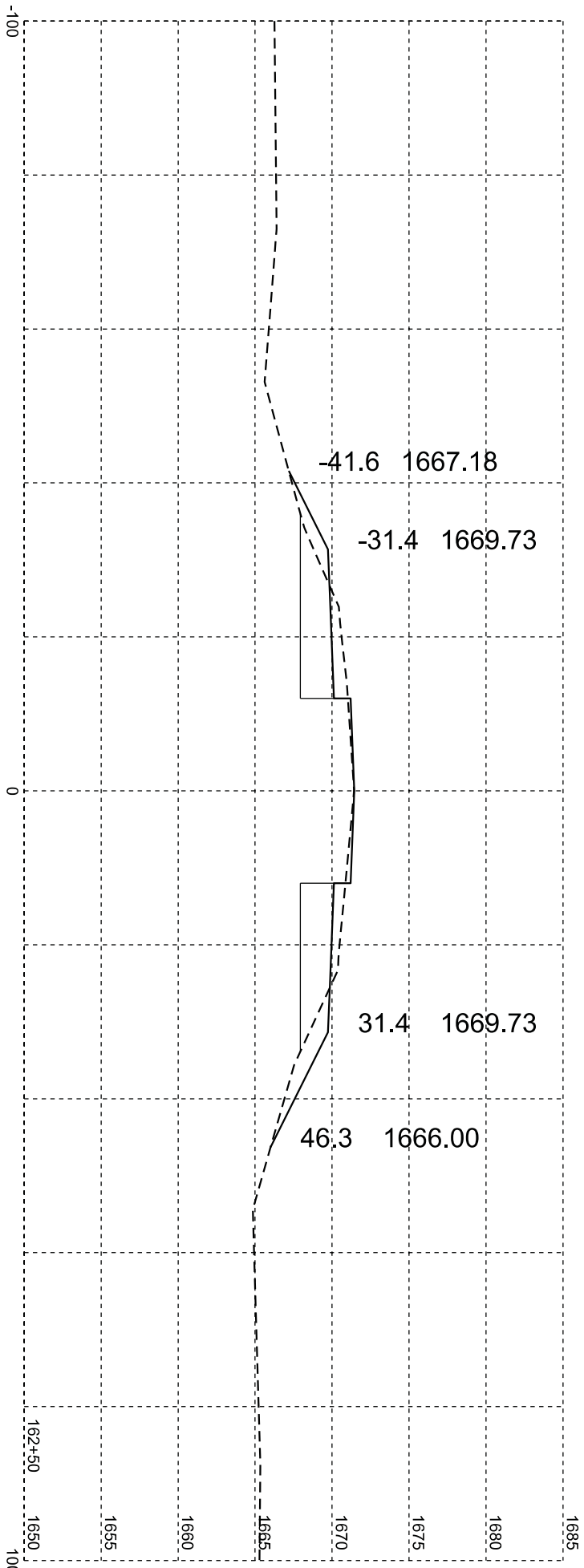

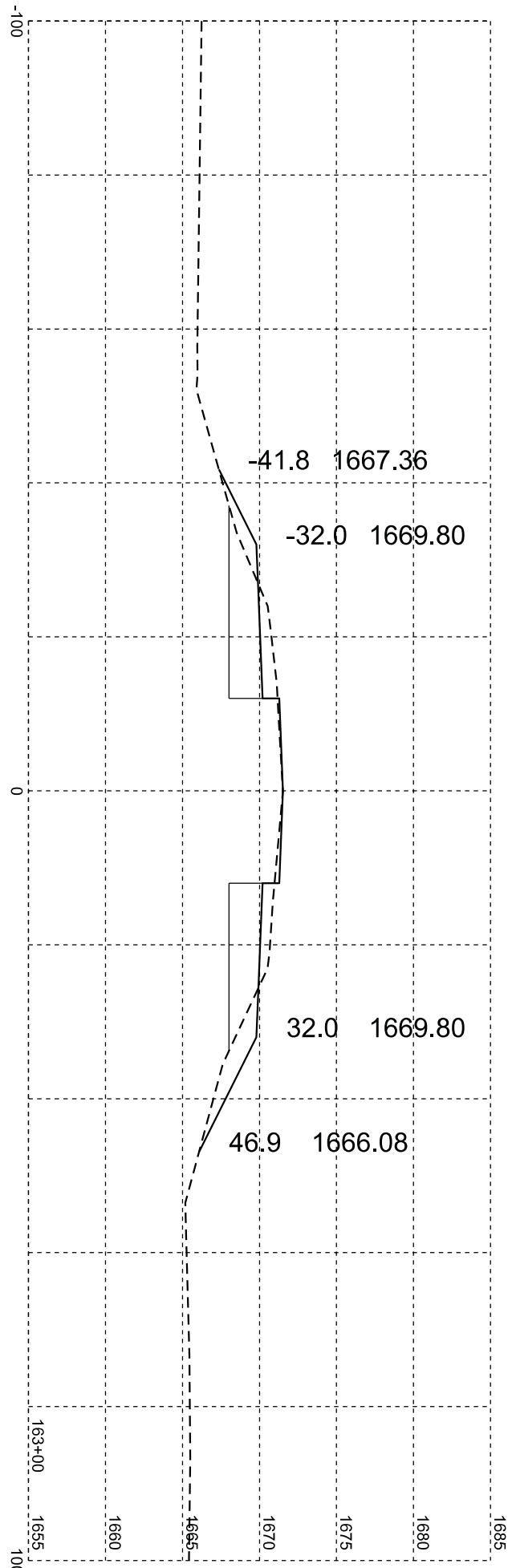

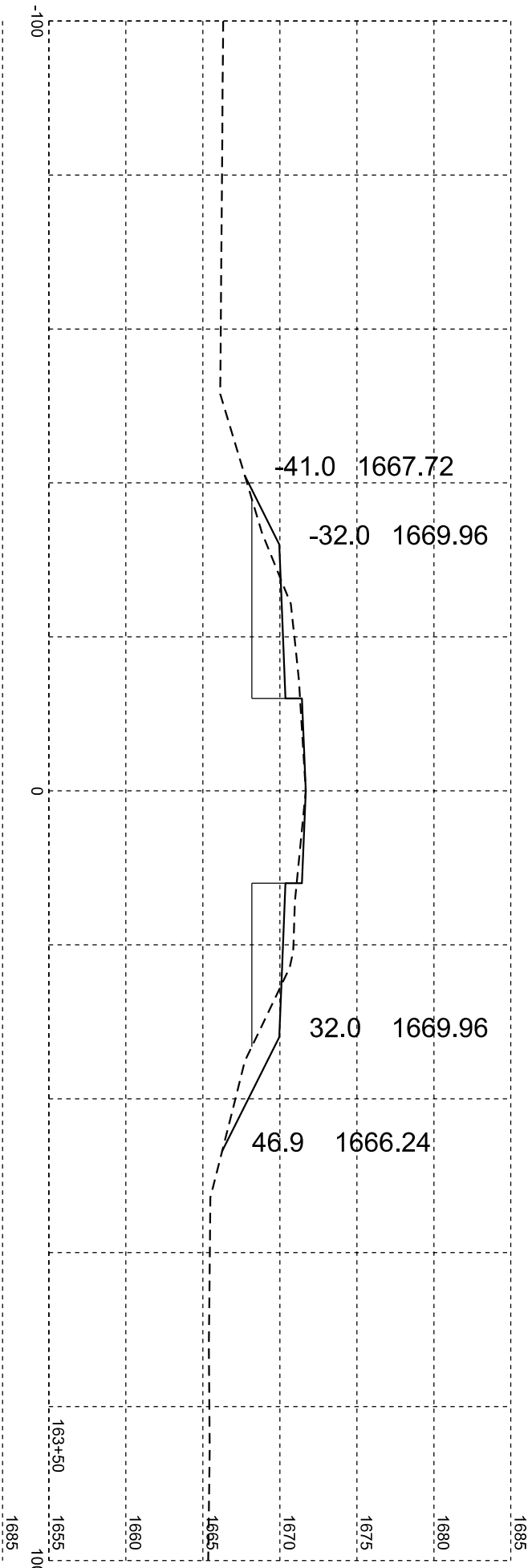

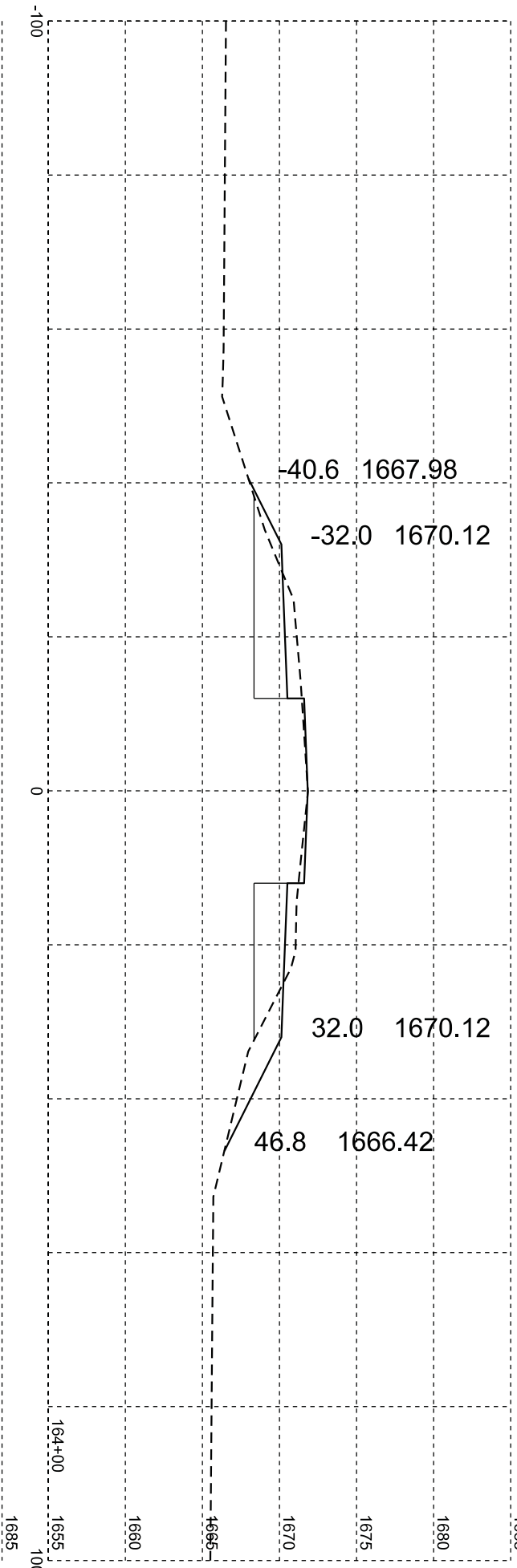

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
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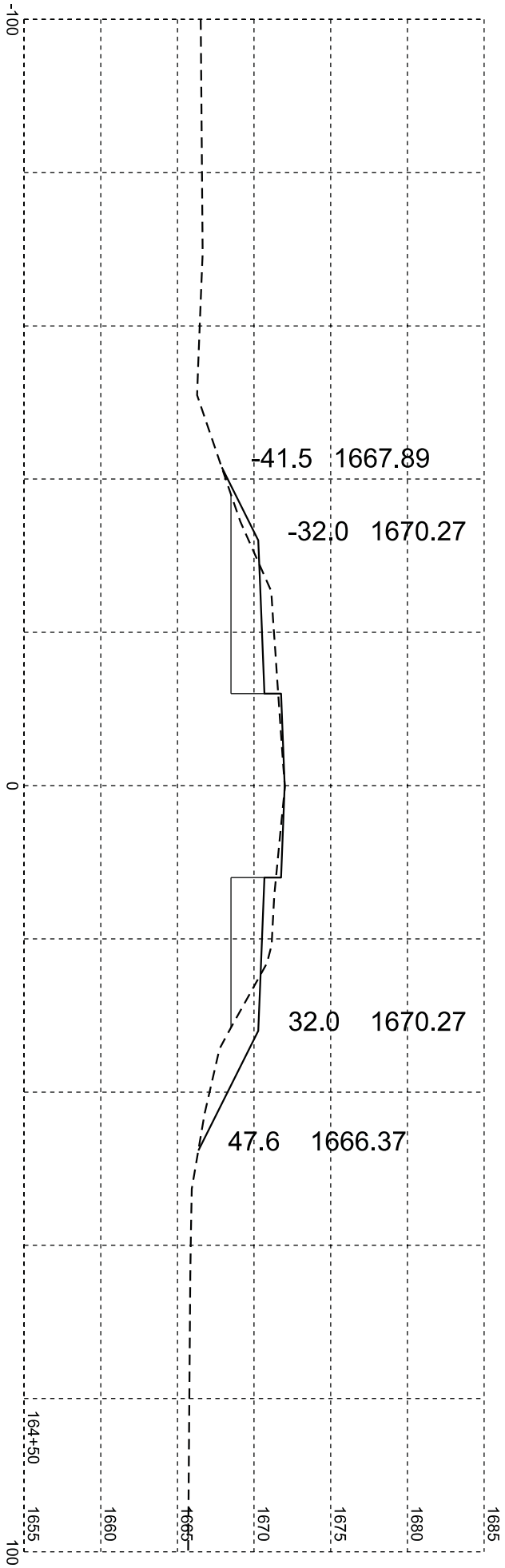

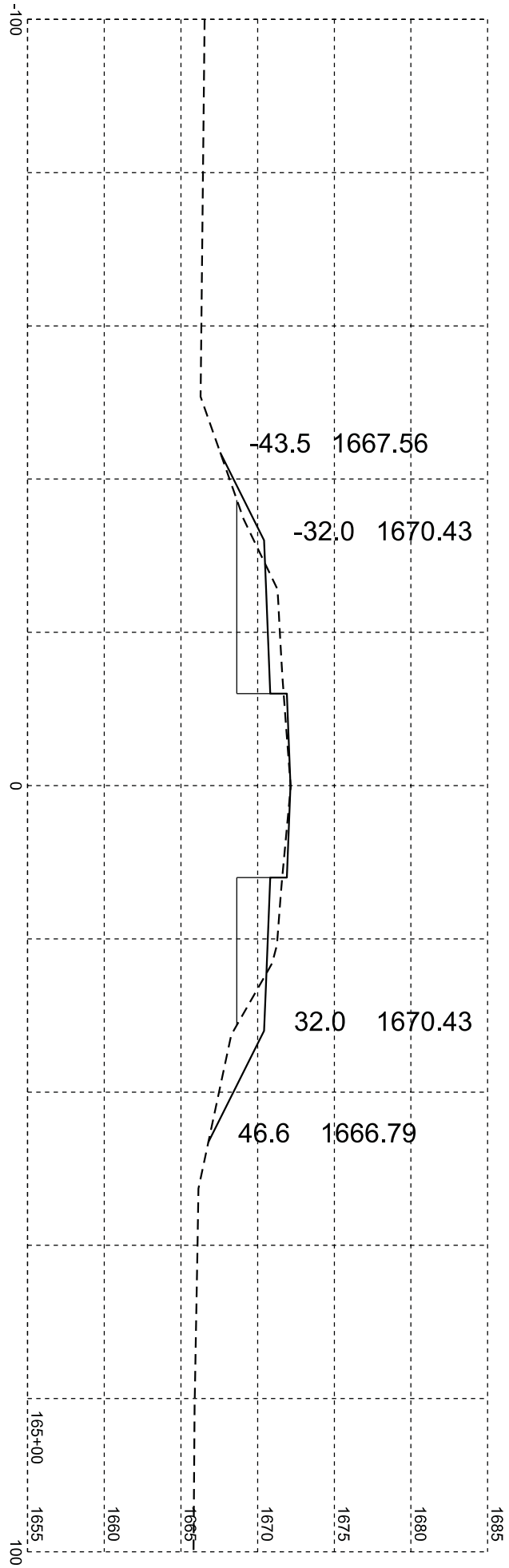

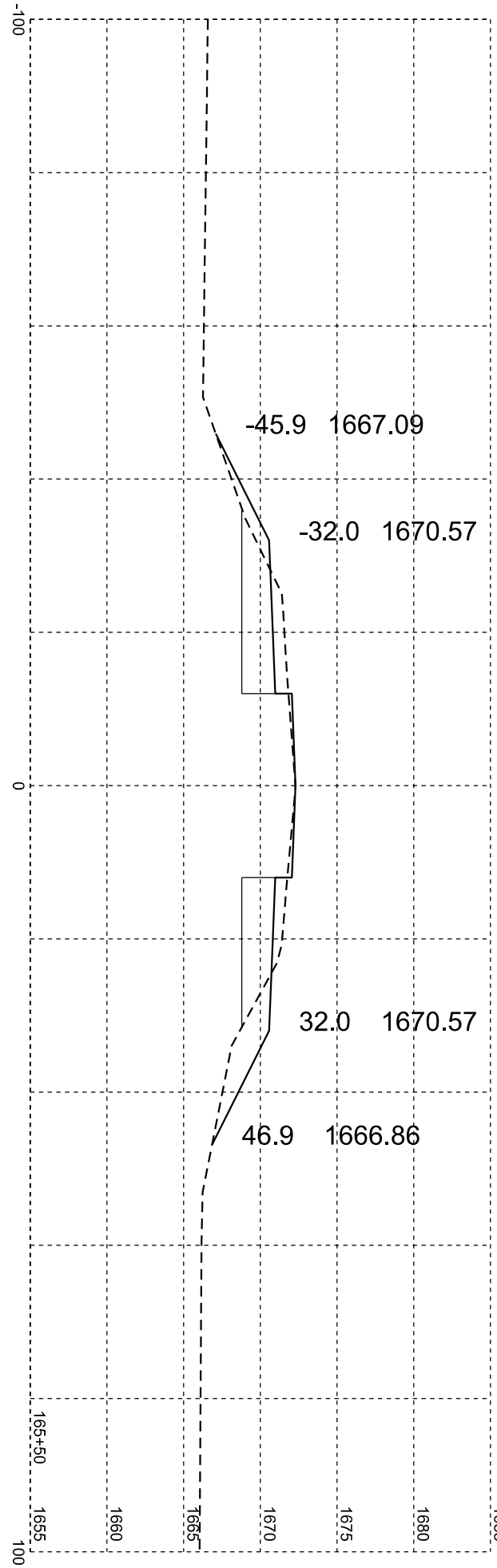

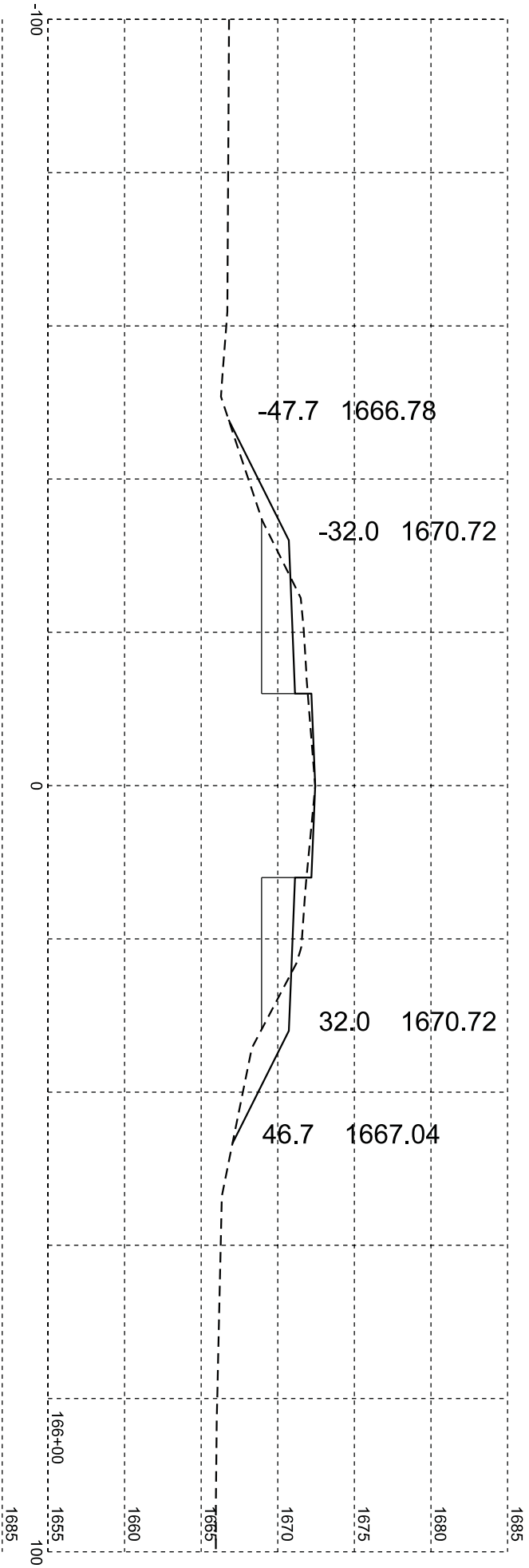

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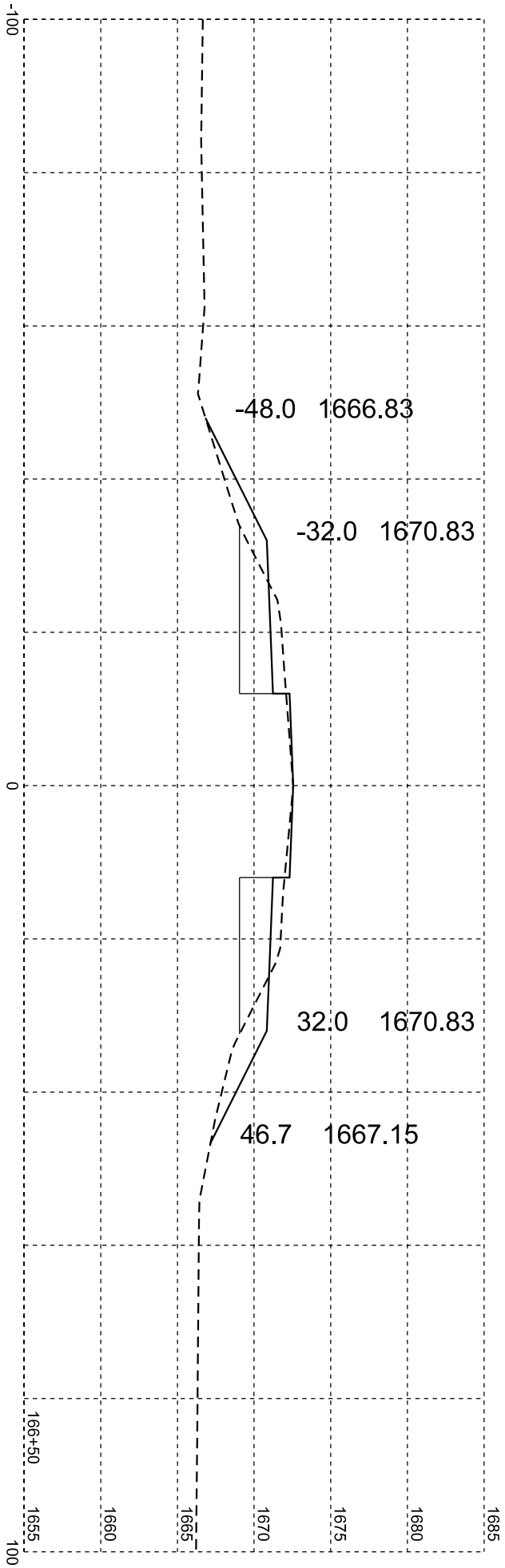

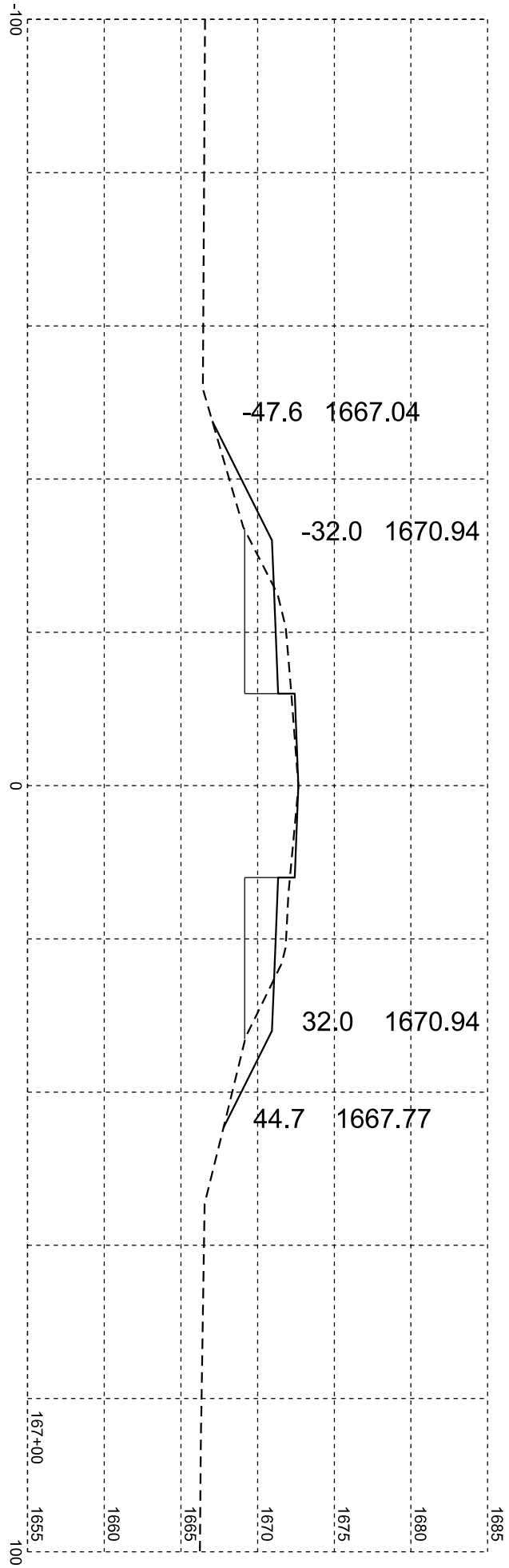

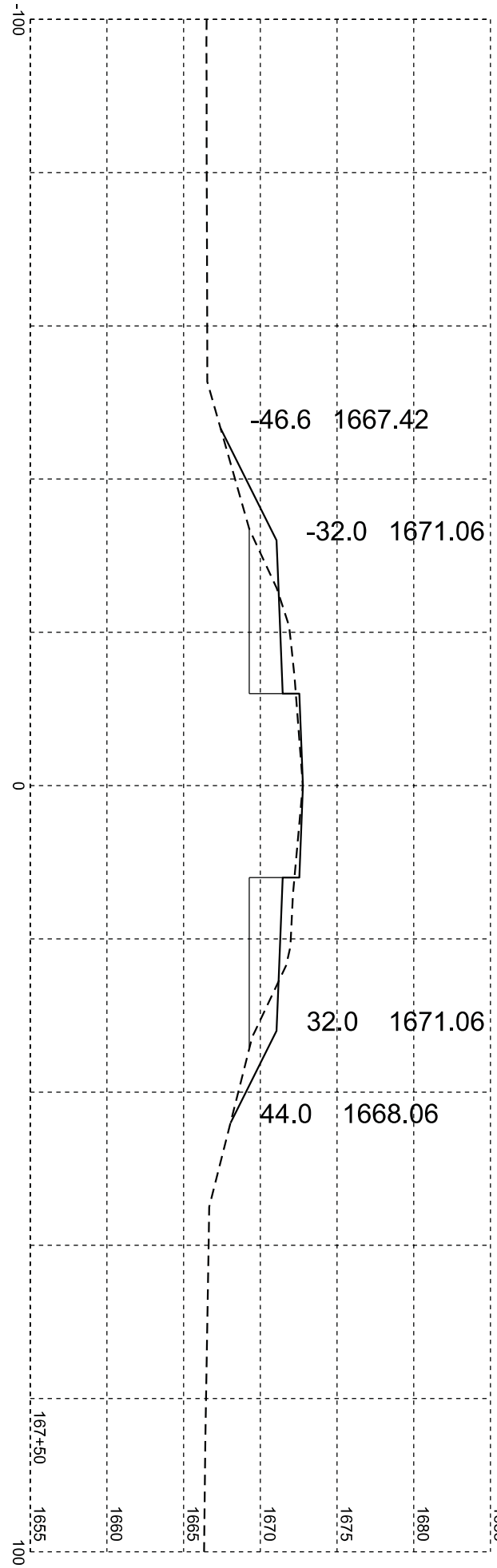

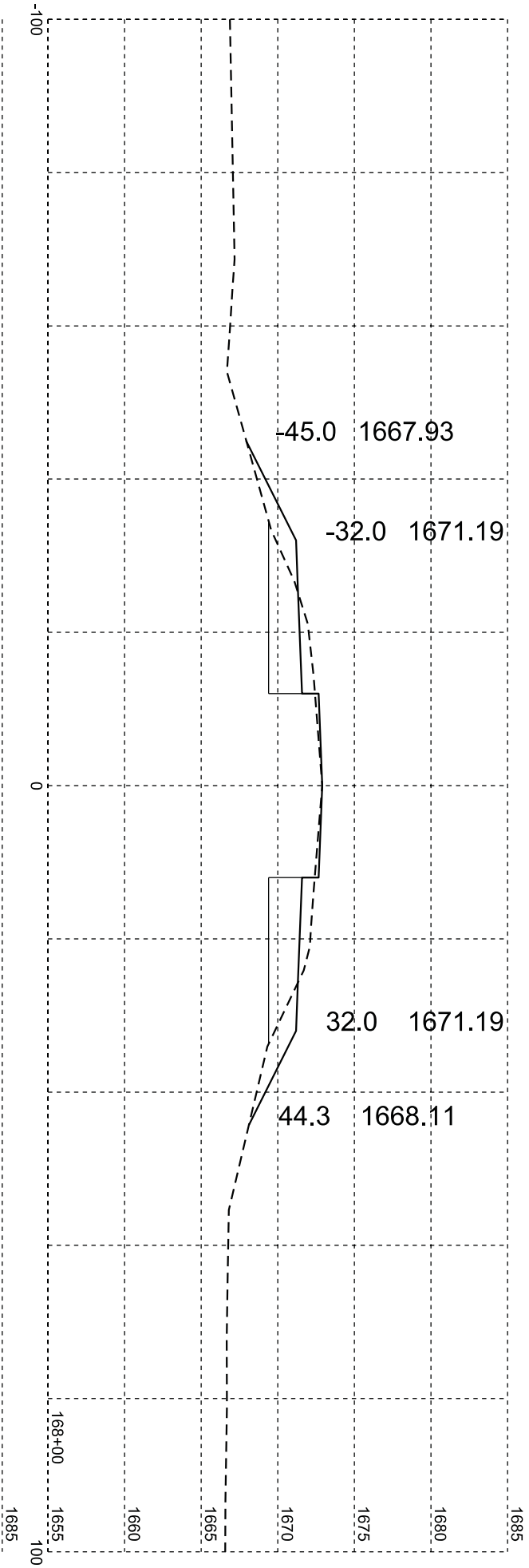

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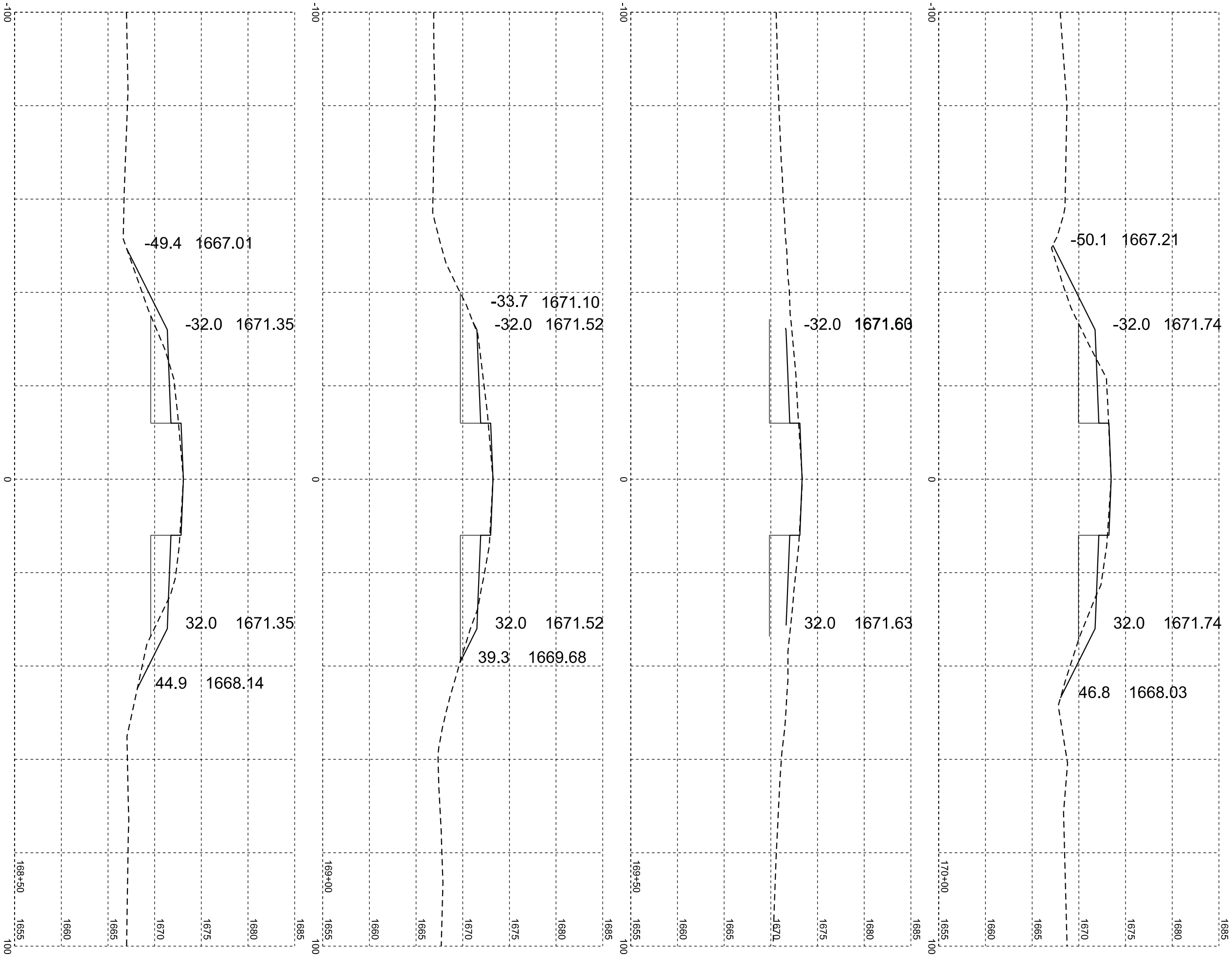

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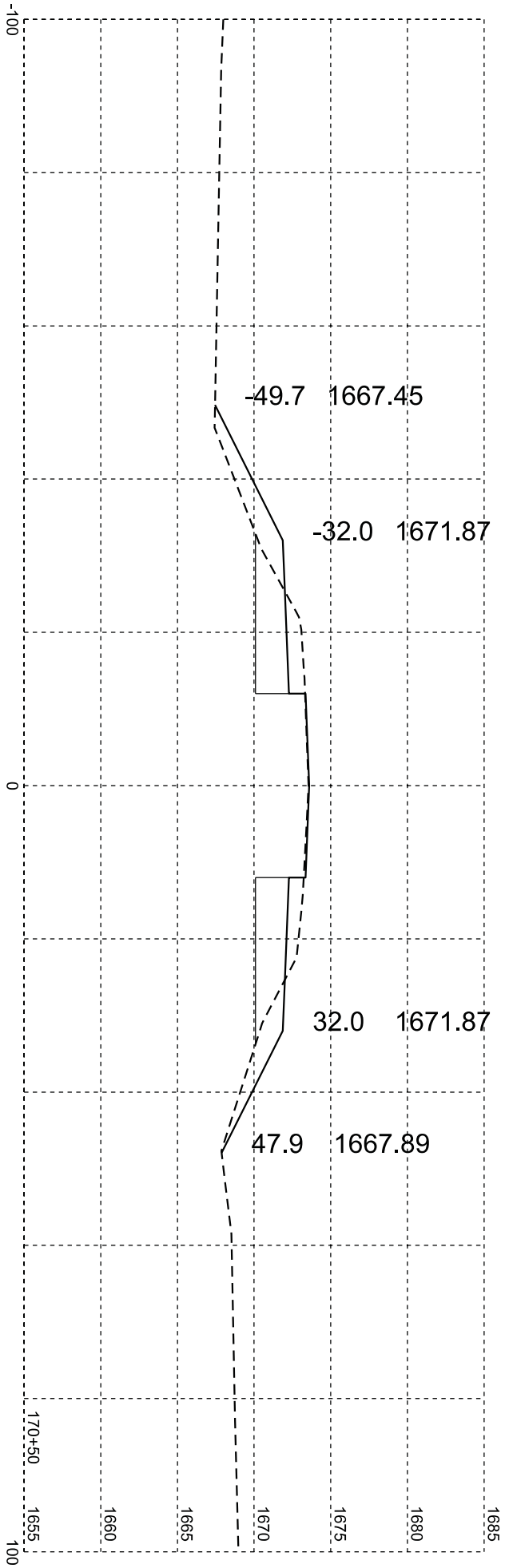

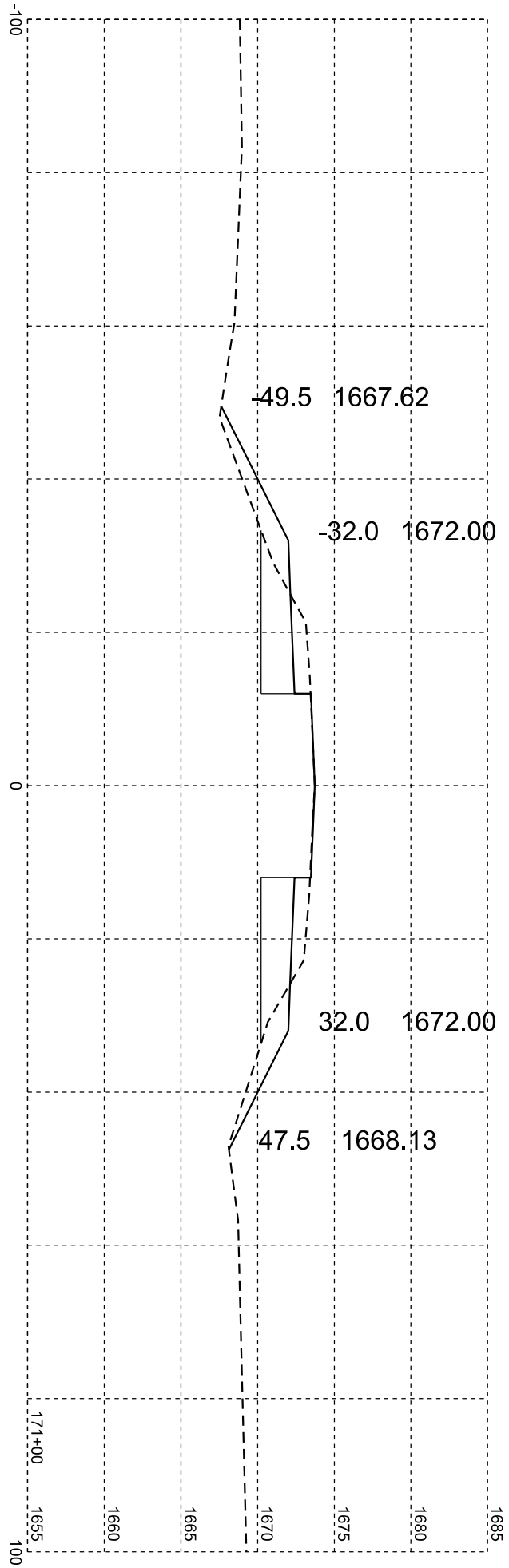

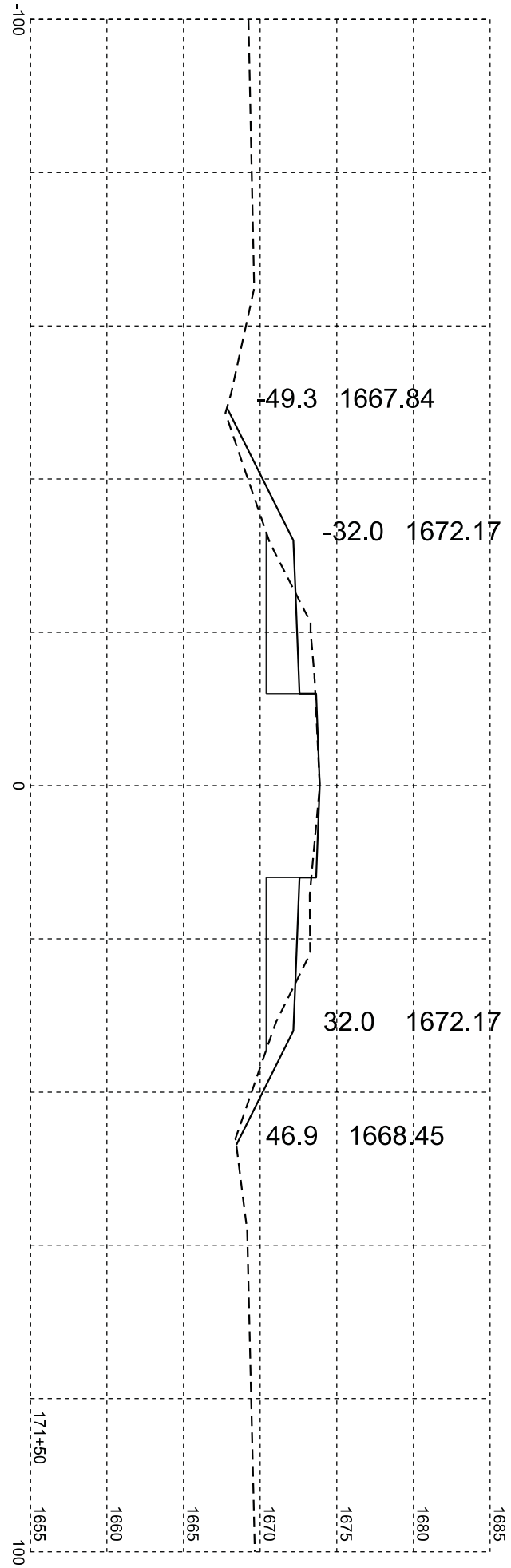

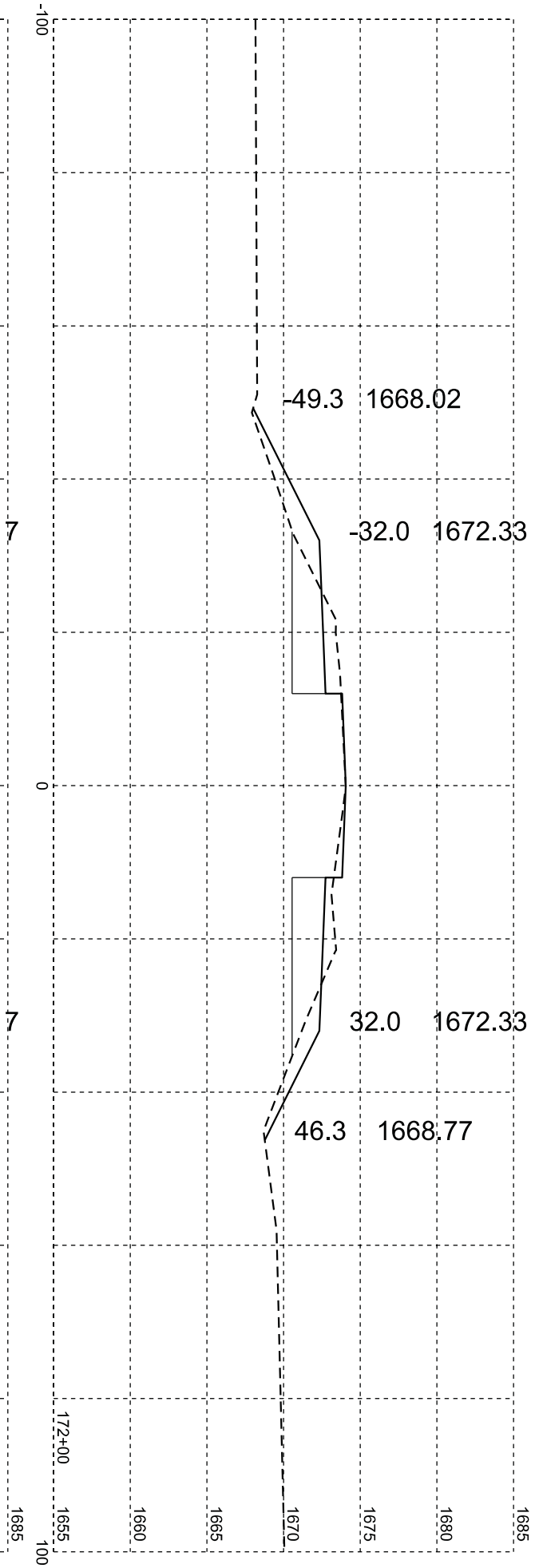

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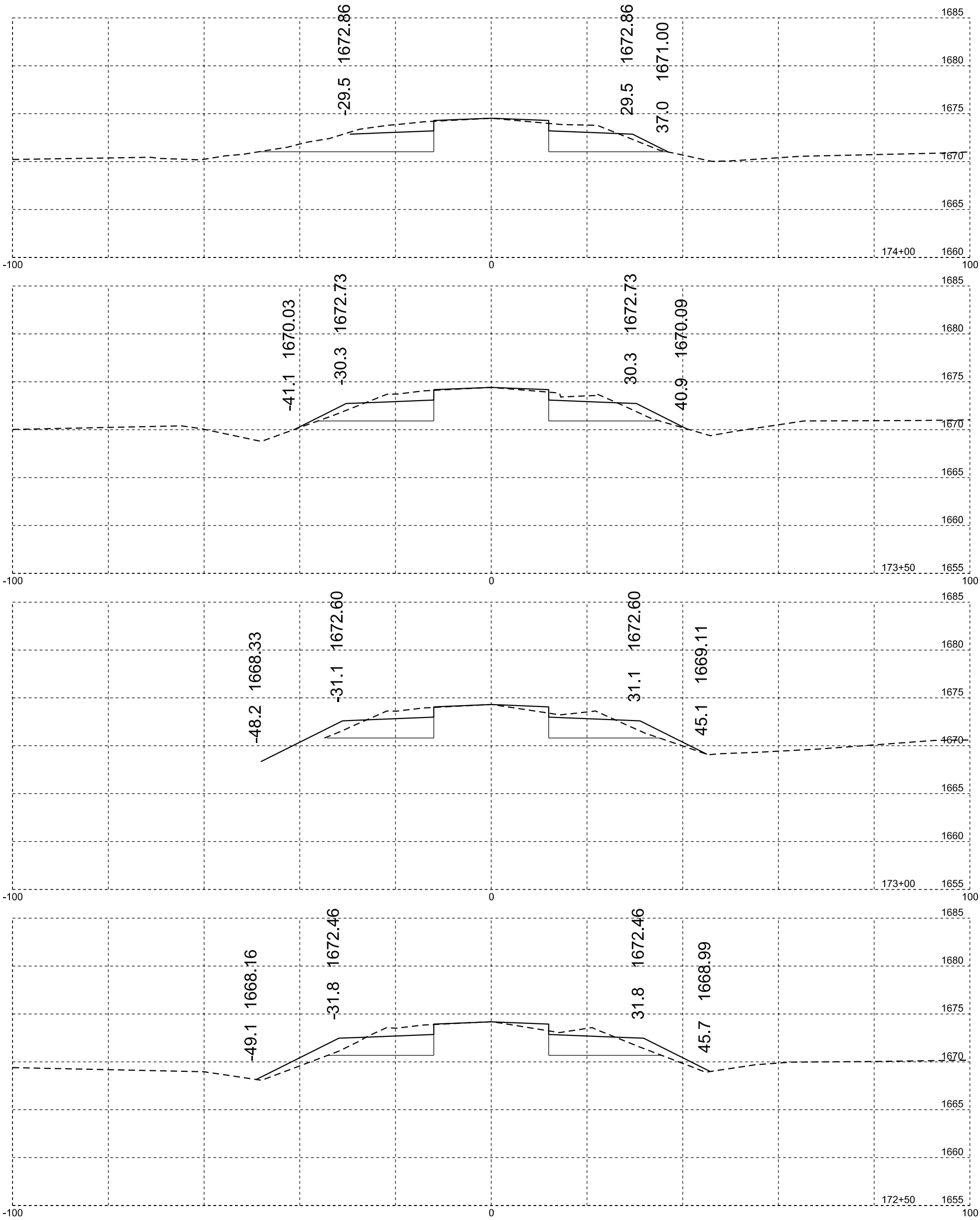

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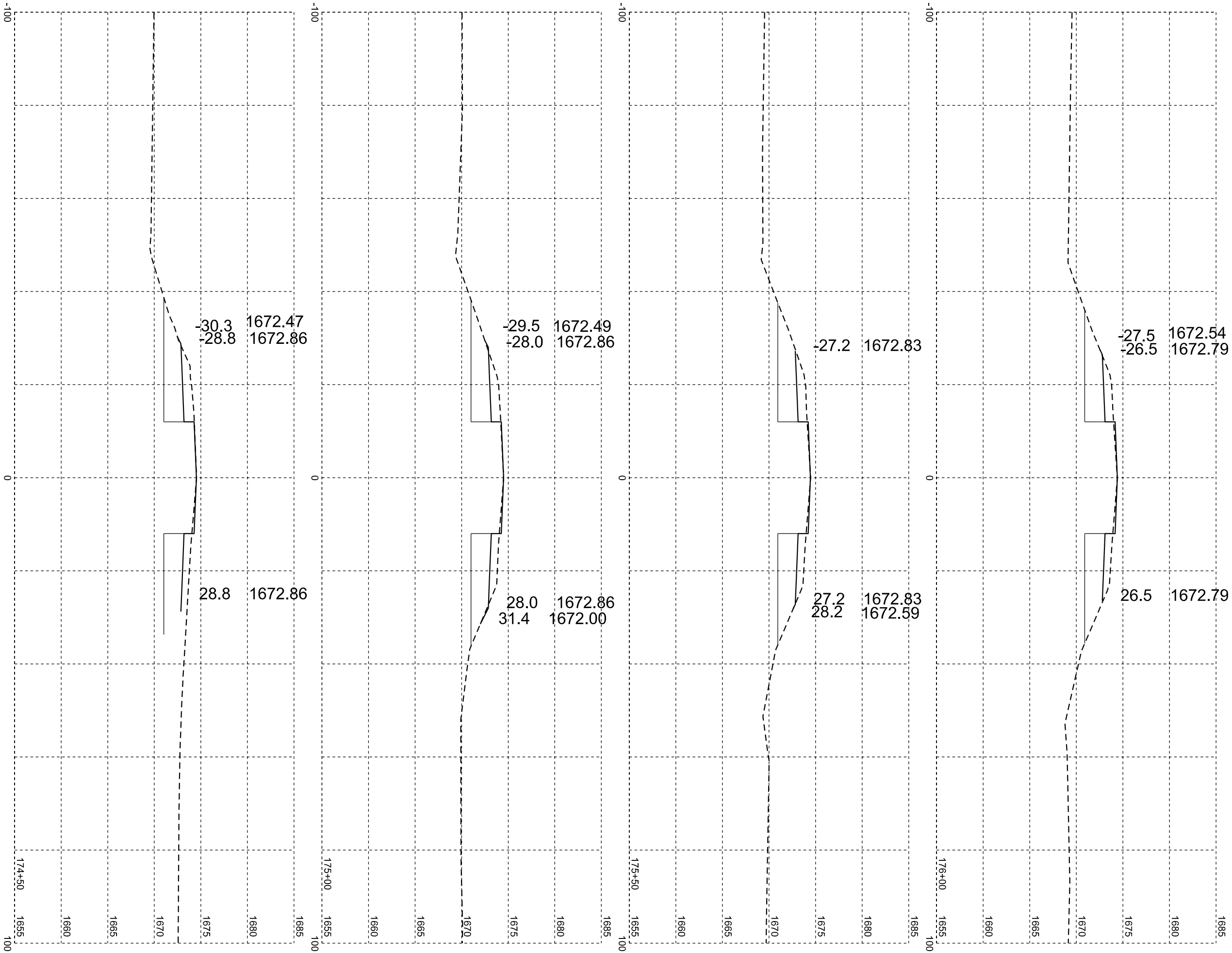

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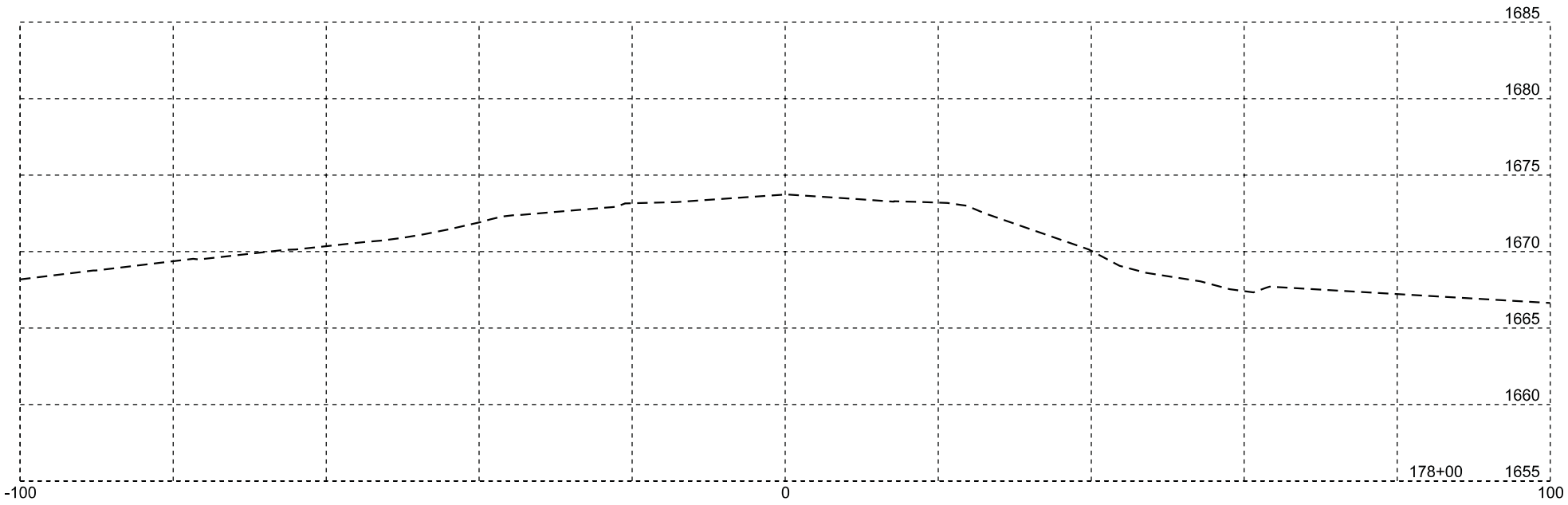

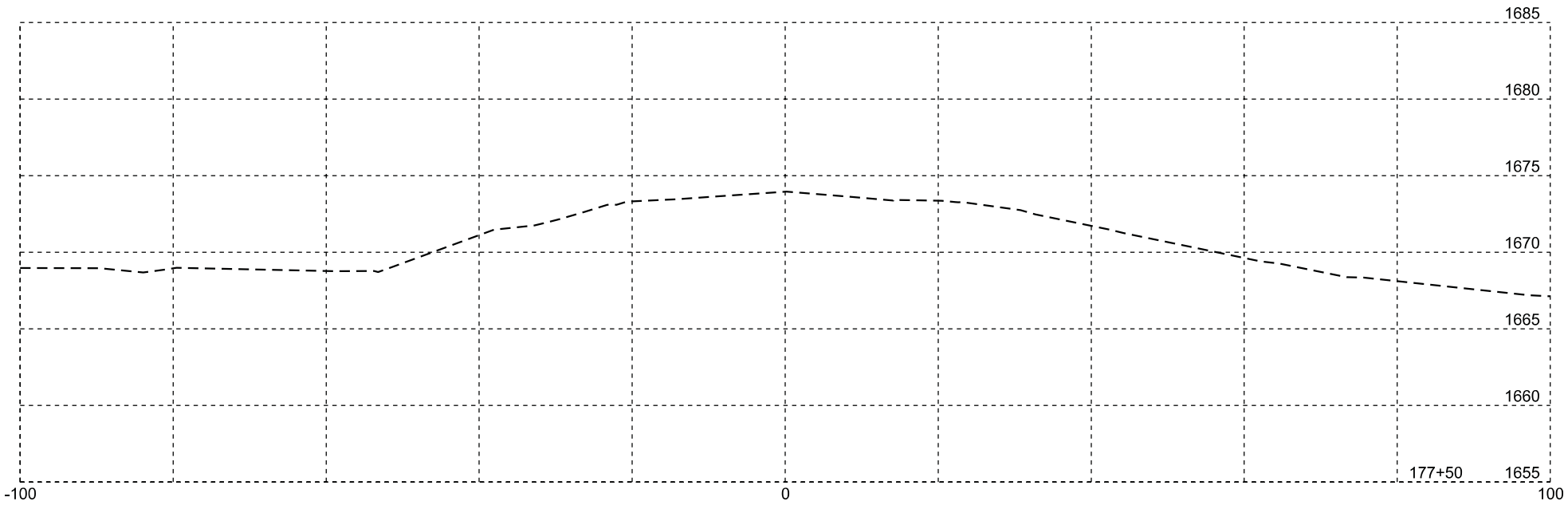

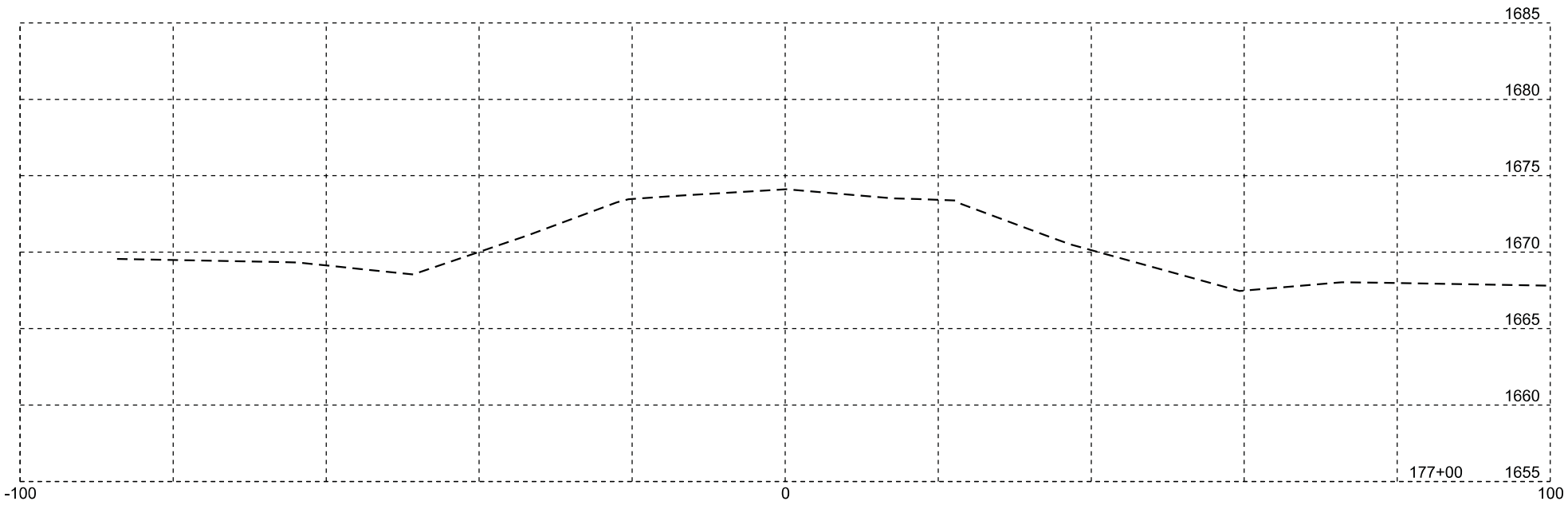

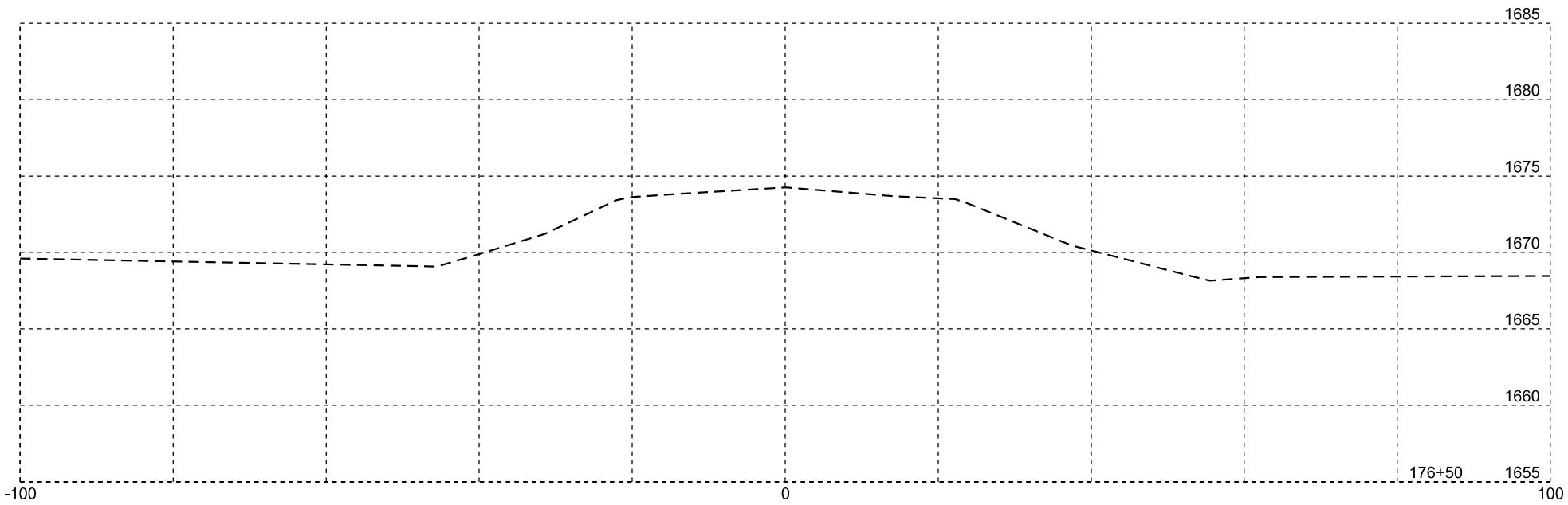

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
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STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
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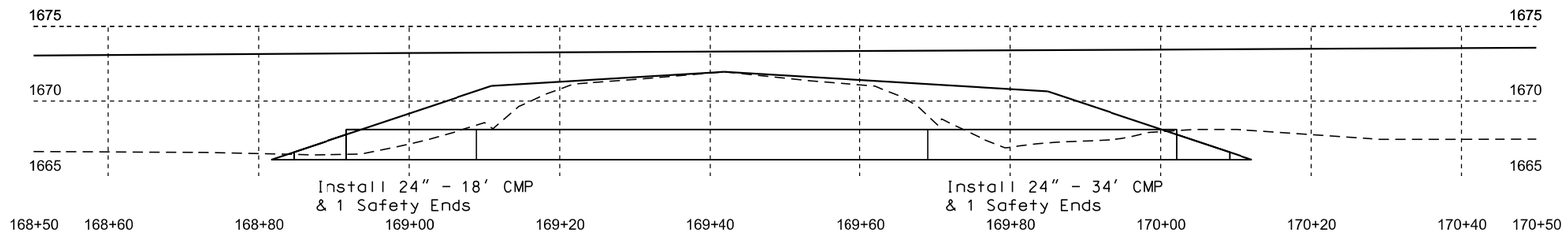

PLOT SCALE - 1:20

PLOTTED FROM - TRAB17982

PLOT NAME - 32

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