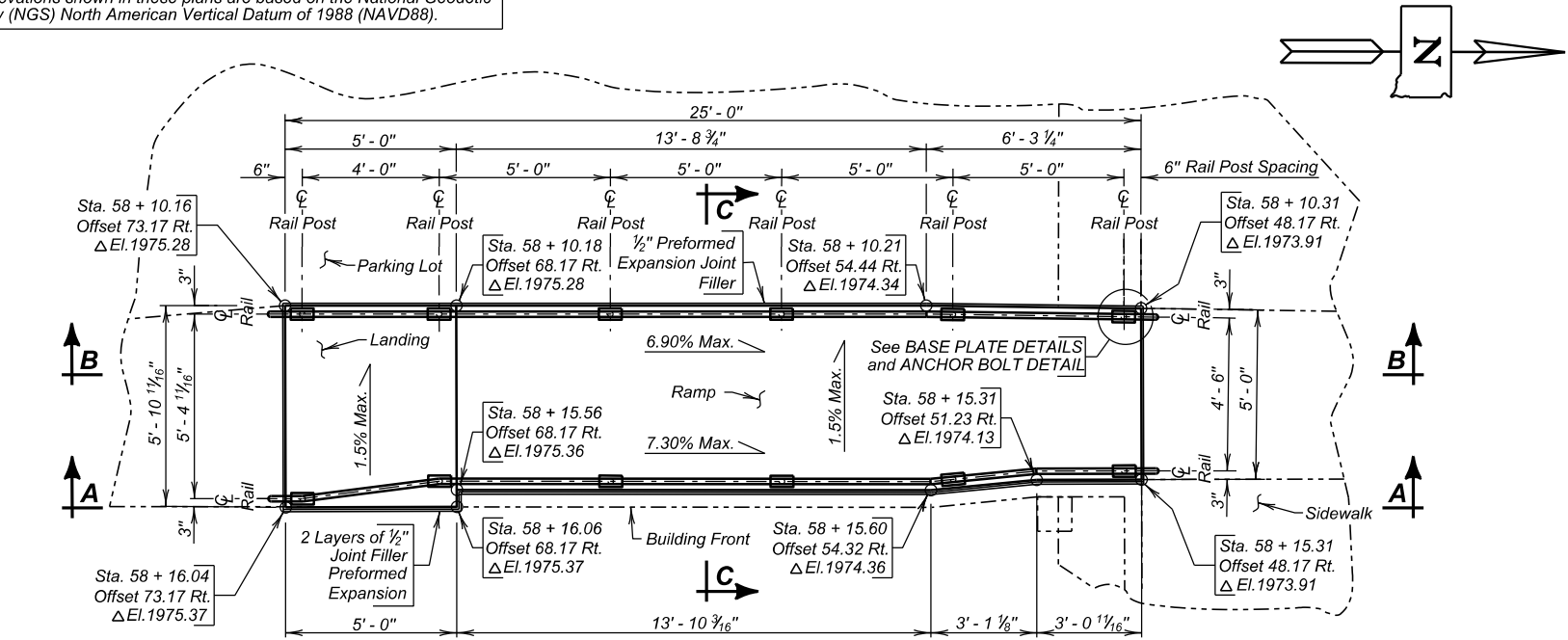


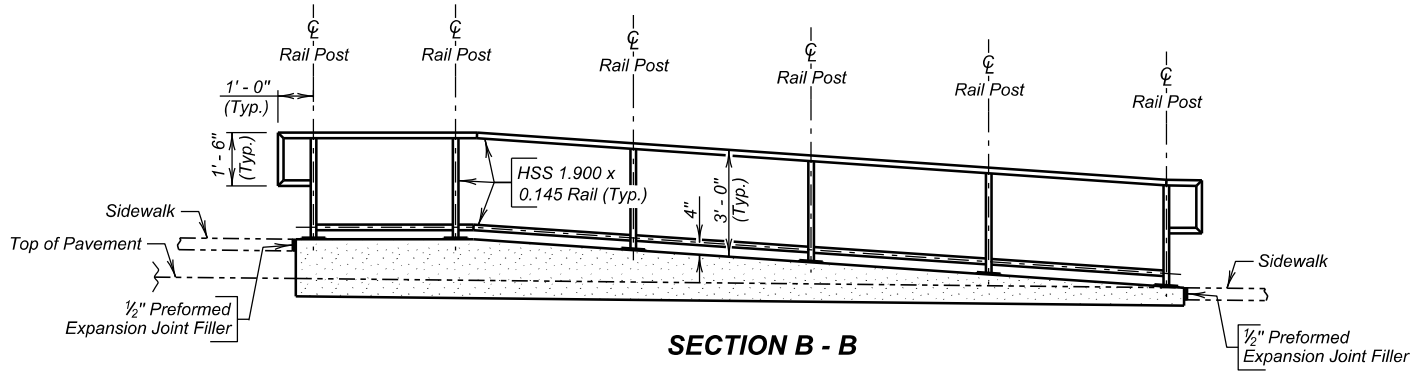
The elevations shown in these plans are based on the National Geodetic Survey (NGS) North American Vertical Datum of 1988 (NAVD88).

Revised June 16, 2021 AG

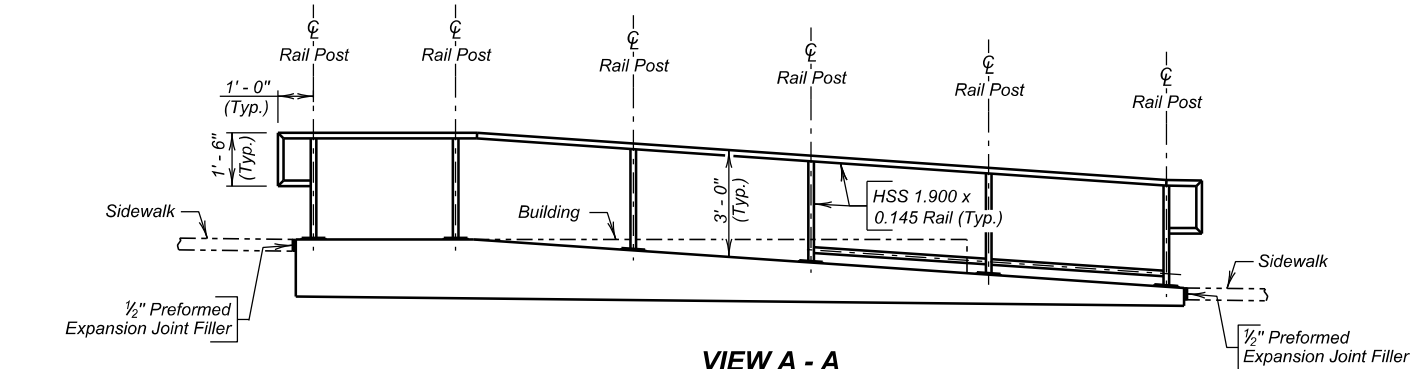
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	NH 0018(191)250 P 0044(188)253	B135	B196



PLAN



SECTION B - B

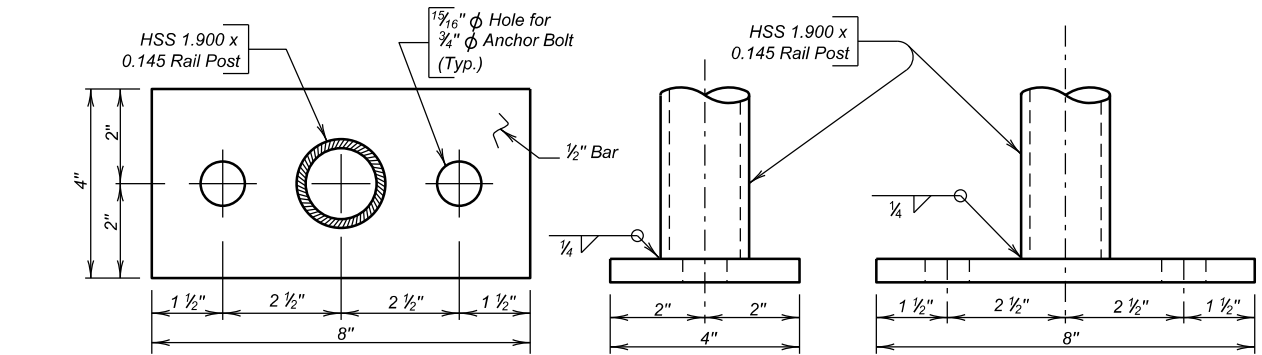


VIEW A - A

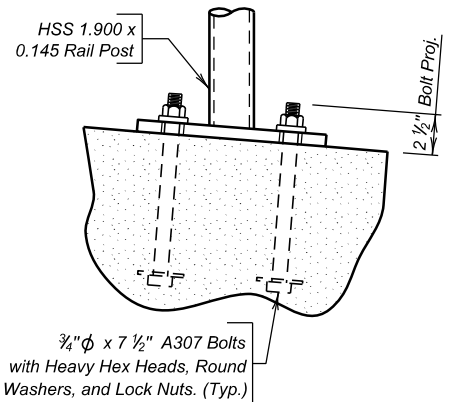
ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Class M6 Concrete	Cu. Yd.	6.0
Epoxy Coated Reinforcing Steel	Lb.	307
Pipe Handrail	Ft.	52

INDEX OF SHEETS-

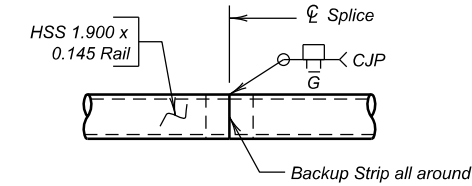
Sheet No. 1 - General Drawing and Notes  
Sheet No. 2 - Ramp Details



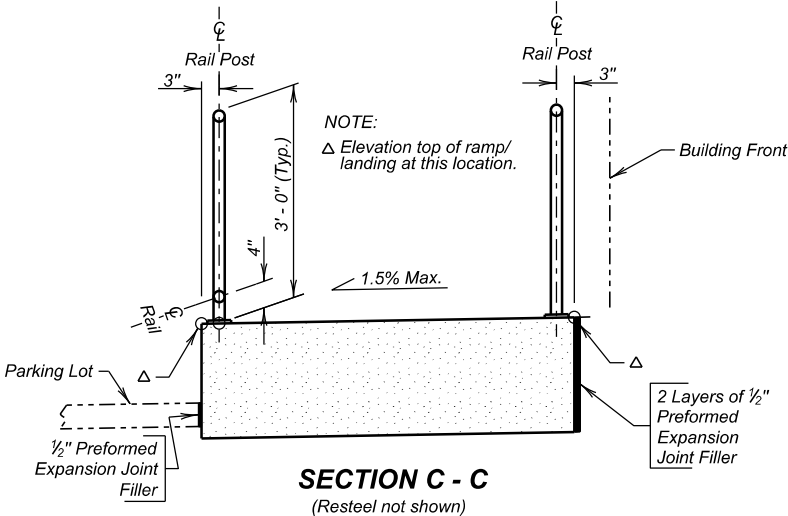
BASE PLATE DETAILS



ANCHOR BOLT DETAIL



RAIL SPLICE DETAILS



SECTION C - C  
(Resteel not shown)

SPECIFICATIONS

South Dakota Standard Specifications for Roads and Bridges, Current Edition and required Provisions, Supplemental Specifications and Special Provisions as included in the Proposal.

GENERAL NOTES

- The plans elevations and slopes shown to construct the ramp and landing are based on the existing doorway threshold elevation. The doorway threshold elevation shall be field verified and if the field verified elevation is different than that shown in the plans adjust ramp and stairway elevations accordingly. If field elevations differ from plans elevations by more than one inch, contact the Bridge Construction Engineer before proceeding with construction.
- All concrete shall be Class M6 in accordance with Section 462.
- All reinforcing steel shall be epoxy coated and shall conform to ASTM A615, Grade 60.
- Use 2" clear cover on all reinforcing steel except as shown.
- All concrete shall be thoroughly tamped and spaded against forms to leave a smooth surface without honeycomb. All exposed edges shall be chamfered 3/4" except as shown.
- Place concrete on undisturbed soil. If backfilling is necessary, compact with mechanical tampers to the satisfaction of the Engineer.
- The concrete sidewalk shall be constructed in accordance with Section 651.
- Cost of the 1/2" Preformed Expansion Joint Filler shall be incidental to the contract unit price per cubic yard for "Class M6 Concrete".
- All costs for constructing ramps, stairways and pipe hand railing including labor, material equipment and incidentals necessary to complete the work shall be included in the Class M6 concrete, Epoxy Coated Reinforcing Steel and Pipe Handrail bid items. Payment will be for plans quantities regardless of the quantity actually used.

SHOP PLANS

The fabricator shall submit shop plans in accordance with the Specifications. Shop plan submittals shall be sent to the Office of Bridge Design.

GENERAL DRAWING & QUANTITIES  
FOR  
ACCESS RAMP "C"

IN WINNER  
STA. 58 + 10.31 TO  
STA. 58 + 15.31 - RT.  
PCN 03TK

SEC. 20-T99N-R76W  
NH 0018(191)250

TRIPP COUNTY  
S. D. DEPT. OF TRANSPORTATION  
JANUARY 2021

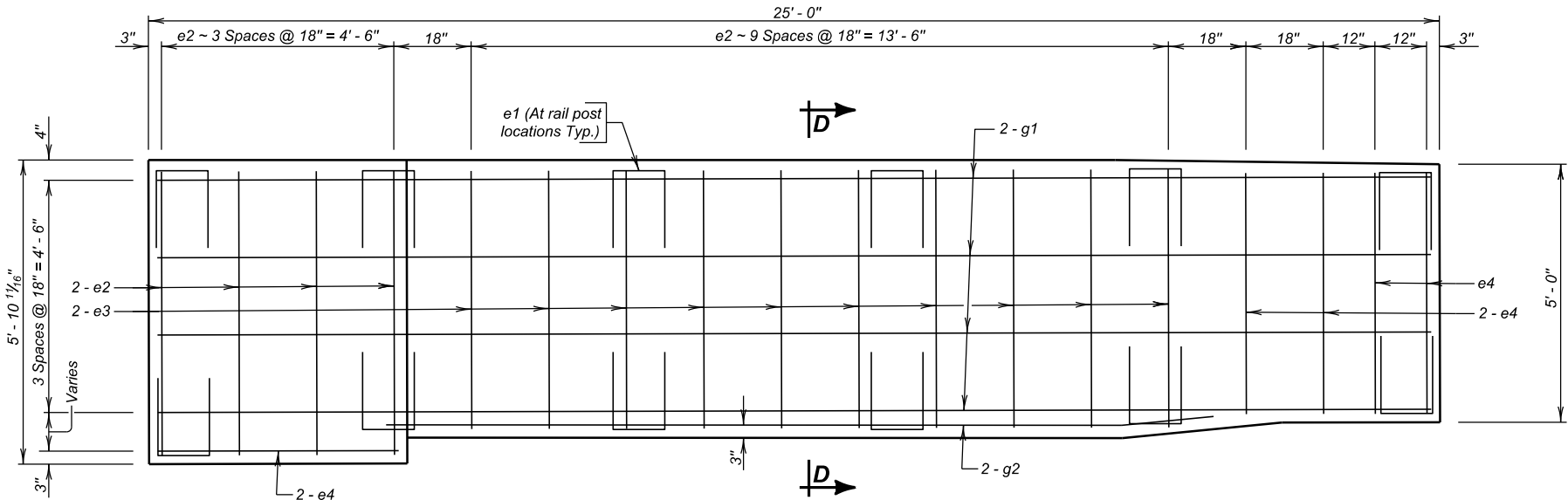
1 OF 2

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

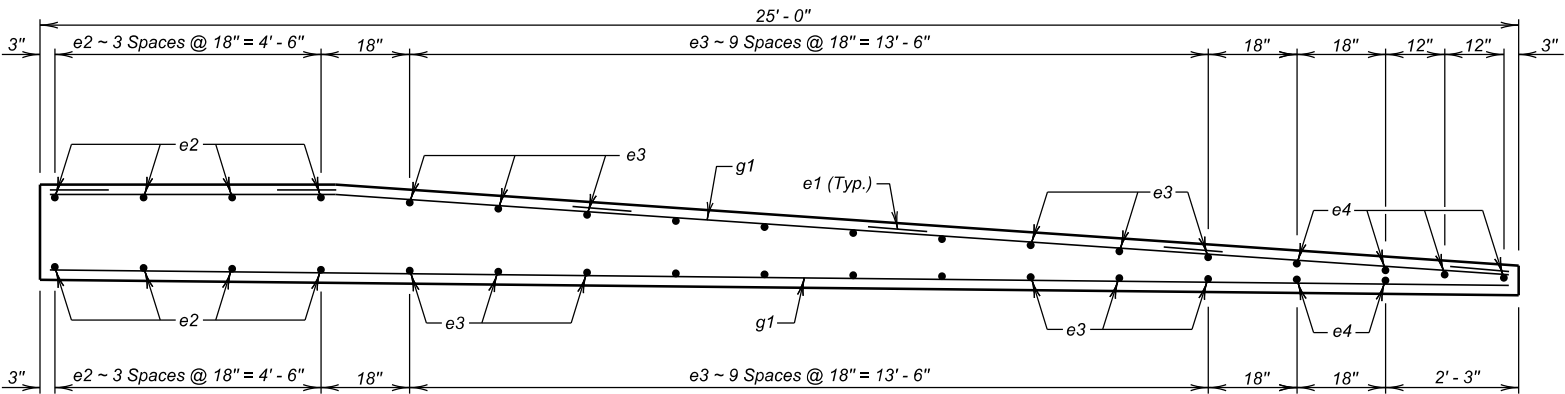
DESIGNED BY	CK. DES. BY	DRAFTED BY	BRIDGE ENGINEER
BT TRIP03TK	AG 03TKTC01	BT	Steve A. Johnson

Revised June 16, 2021 AG

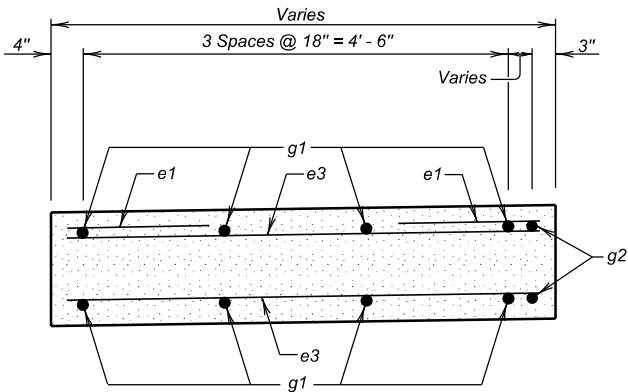
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0018(191)250 P 0044(188)253	B136	B196



**PLAN**  
(Railing not Shown)



**ELEVATION**  
(Railing not Shown)



**SECTION D - D**  
(Railing not shown)

**REINFORCING SCHEDULE**

Mk.	No.	Size	Length	Type	Bending Details
e1	12	4	4' - 0"	17	
e2	8	4	5' - 6"	Str.	
e3	20	4	5' - 0"	Str.	
e4	8	4	4' - 9"	Str.	
* g1	8	4	24' - 9"	Str.	
* g2	2	4	16' - 0"	Str.	

NOTES:  
All dimensions are out to out of bars.  
\* Bend in field as necessary to fit.

**PIPE HANDRAIL**

- Pipe handrail will not be ordered until the ramps, landings and stairways are constructed and field measurements for in-place length and slope are taken.
- All rail posts will be built vertical.
- Steel pipe for railing and posts will conform to ASTM A500, Grade B. Railpost base plates will conform to ASTM A709, Grade 36.
- The Contractor may use either cast in place anchor bolts or drilled and epoxied anchor rods for anchoring the pipe handrail. Anchor Bolts and nuts will conform to ASTM A307. Anchor rods will conform to ASTM 1554, Grade 36. Washers will be in accordance with ASTM F436. Hardware will be galvanized in accordance with ASTM F2329. Bolts will be hex head "Structural" type with heavy hex, lock nuts, and round washers.
- All anchor bolts and rods will be tightened to a torque of 120 ft./lbs. (approximated without the use of a calibrated torque wrench).
- Epoxy will be in accordance with ASTM C881 Type IV. Hole size will be as per the epoxy manufacturer's recommendations. Core bits will not be used to drill anchor rod holes.
- All steel railing will be galvanized after shop welding in accordance with ASRM A123 and will be painted in accordance with Section 411 of the Specifications and the color will be an approved black (Federal Standard 595B Color 27038). The galvanized steel railing will be cleaned in accordance with ASTM D6386 before painting.
- Welding and weld inspection will be done in accordance with AWS D1.1-(Current Year) Structural Welding Code - Steel.
- The cost of structural steel, anchor bolts or anchor rods, painting, galvanizing, welding, weld inspection, and that which is incidental to the fabrication and installation of the Pipe Handrail will be incidental to the contract unit price per foot for "Pipe Handrail".
- Alternate rail designs, including aluminum rail, may be submitted through proper channels to the Office of Bridge Design for approval.

**RAMP DETAILS  
FOR  
ACCESS RAMP "C"**

IN WINNER  
STA. 58 + 10.31 TO  
STA. 58+ 15.31 - RT.

SEC. 20-T99N-R76W  
NH 0018(191)250

TRIPP COUNTY  
S. D. DEPT. OF TRANSPORTATION  
JANUARY 2021

DESIGNED BY BT TRIP03TK	CK. DES. BY AG 03TKTC02	DRAFTED BY BT Steve A. Johnson	BRIDGE ENGINEER
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Revised June 16, 2021 AG

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	NH 0018(191)250 P 0044(188)253	B137	B196

*South Dakota Standard Specifications for Roads and Bridges, Current Edition and required Provisions, Supplemental Specifications and Special Provisions as included in the Proposal.*

1. The plans elevations and slopes shown to construct the ramp and landing are based on the existing doorway threshold elevation. The doorway threshold elevation shall be field verified and if the field verified elevation is different than that shown in the plans adjust ramp and stairway elevations accordingly. If field elevations differ from plans elevations by more than one inch, contact the Bridge Construction Engineer before proceeding with construction.

2. All concrete shall be Class M6 in accordance with Section 462.
3. All reinforcing steel shall be epoxy coated and shall conform to ASTM A615, Grade 60.
4. Use 2" clear cover on all reinforcing steel except as shown.
5. All concrete shall be thoroughly tamped and spaded against forms to leave a smooth surface without honeycomb. All exposed edges shall be chamfered  $\frac{3}{4}$ " except as shown.
6. Place concrete on undisturbed soil. If backfilling is necessary, compact with mechanical tampers to the satisfaction of the Engineer.
7. The concrete sidewalk shall be constructed in accordance with Section 651.
8. Cost of the  $\frac{1}{2}$ " Preformed Expansion Joint Filler shall be incidental to the contract unit price per cubic yard for "Class M6 Concrete".
9. All costs for constructing ramps, stairways and pipe hand railing including labor, material equipment and incidentals necessary to complete the work shall be included in the Class M6 concrete, Epoxy Coated Reinforcing Steel and Pipe Handrail bid items. Payment will be for plans quantities regardless of the quantity actually used.

*The fabricator shall submit shop plans in accordance with the Specifications. Shop plan submittals shall be sent to the Office of Bridge Design.*

ITEM	UNIT	QUANTITY
Class M6 Concrete	Cu. Yd.	36.7
Epoxy Coated Reinforcing Steel	Lb.	2739
Pipe Handrail	Ft.	251
Granular Fill Material	Ton	56.3

*#For estimating purposes only, a factor of 1.89 tons/cu.yd. was used to convert Cu. Yds. to Tons.*

Sheet No. 1 - General Drawing & Quantities  
Sheet No. 2 - Railing Details and Notes  
Sheet No. 3 - Ramp Details (A)  
Sheet No. 4 - Ramp Details (B)  
Sheet No. 5 - Ramp Details (C)  
Sheet No. 6 - Sidewalk Details

# GENERAL DRAWING & QUANTITIES

## FOR

# ACCESS RAMP "D"

IN WINNER  
STA. 64 + 37.66 TO  
STA. 64 + 95.74 - RT.  
PCN 03TK


SEC. 20-T99N-R76W  
NH 0018(191)250

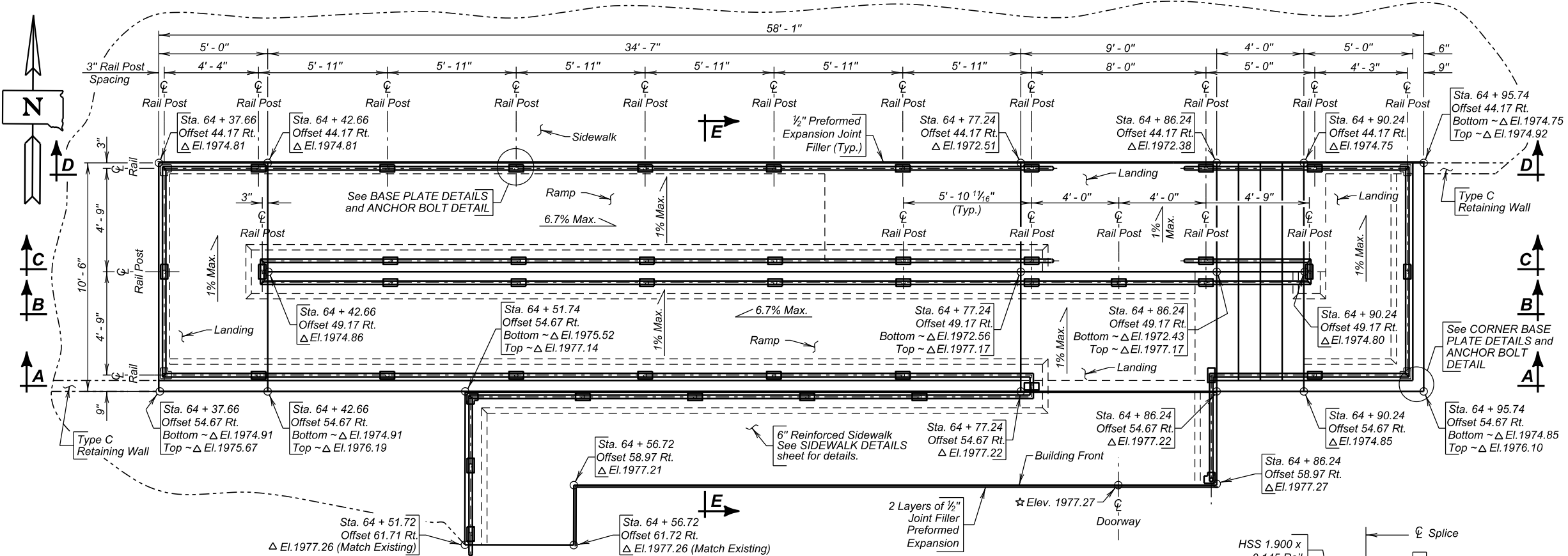
TRIPP COUNTY

S. D. DEPT. OF TRANSPORTATION

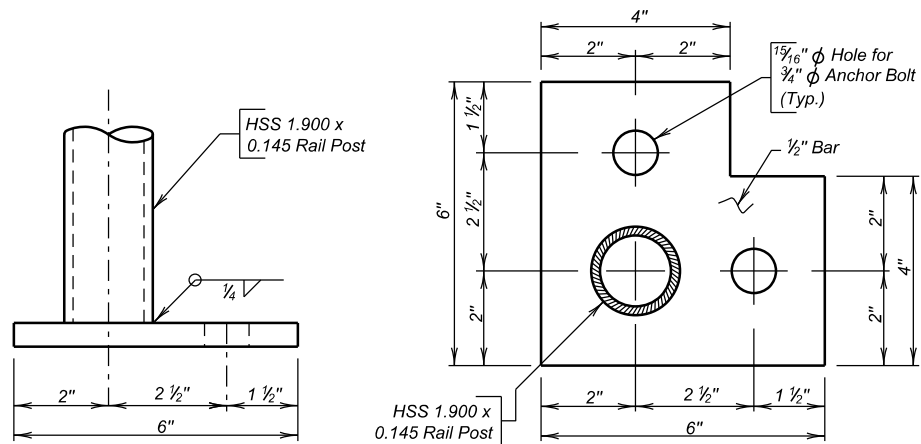
JANUARY 2021

1 OF 6

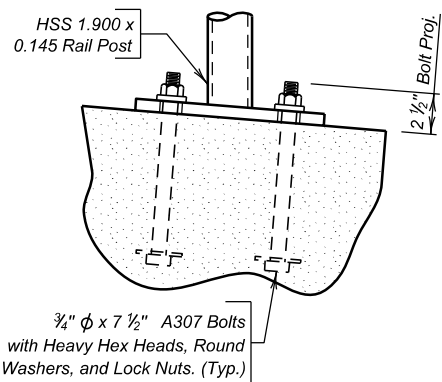
DESIGNED BY BT	CK. DES. BY AG	DRAFTED BY BT	 BRIDGE ENGINEER
TRIP03TK	03TKTD01		



## PLAN



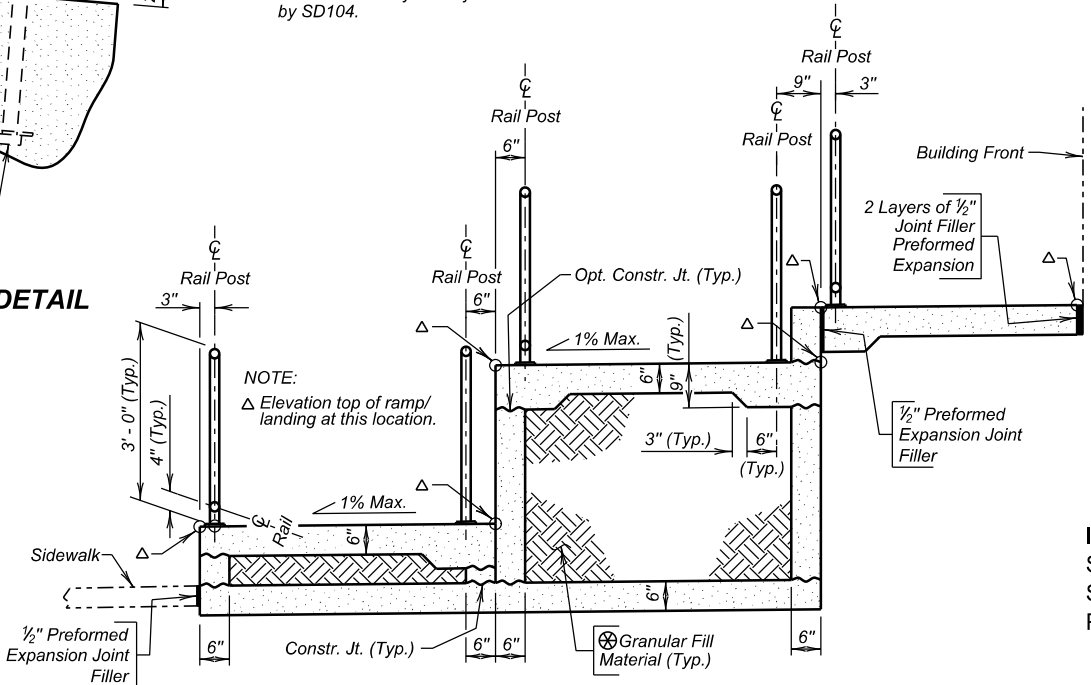
## CORNER BASE PLATE DETAILS



### ANCHOR BOLT DETAIL

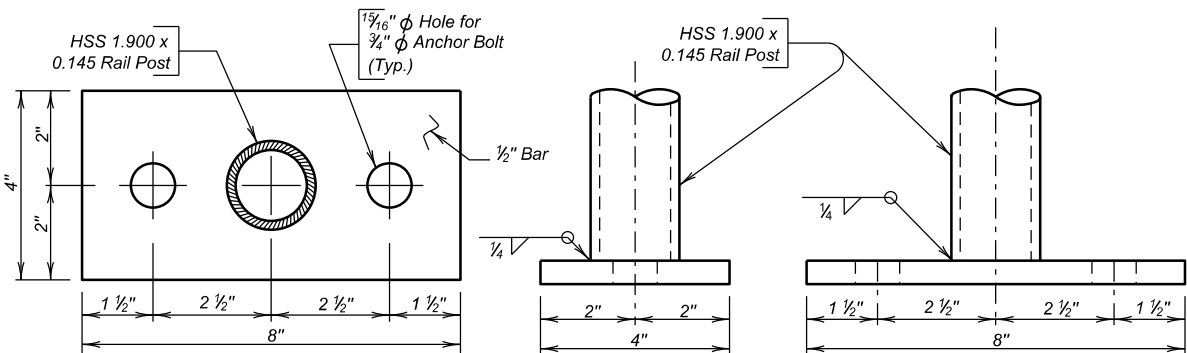
⊗ Granular fill material will be backfilled conforming to the gradation requirements of either granular base course or granular gravel cushion in Section 882 of the Specifications. Compaction will be 95% of the maximum dry density as determined by SD104.

## RAIL SPLICE DETAILS



**SECTION E - E**  
(Resteel not shown)

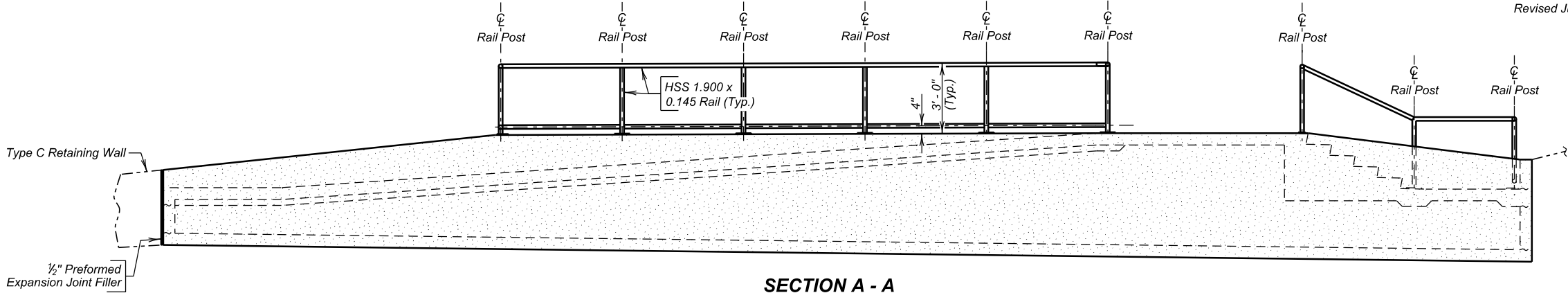
PLANS BY :  
OFFICE OF BRIDGE DESIGN, SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION



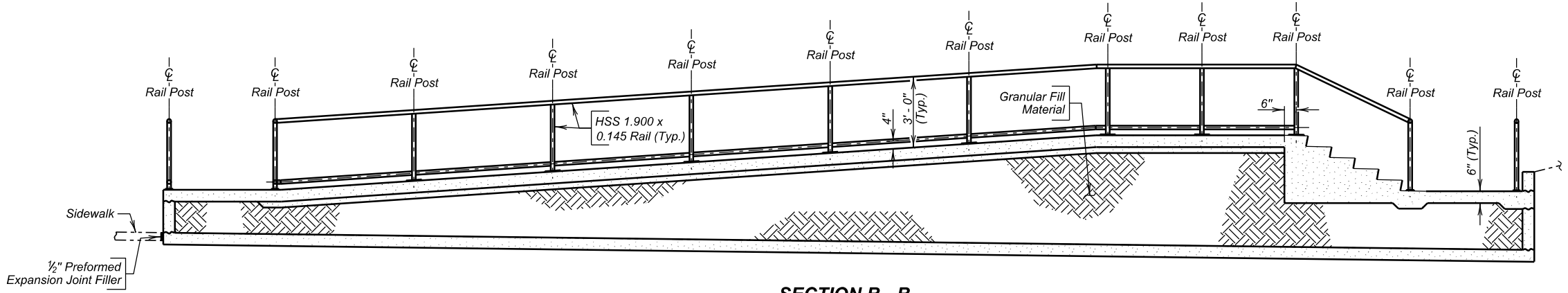
## BASE PLATE DETAILS

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
	NH 0018(191)250 P 0044(188)253	B138	B196

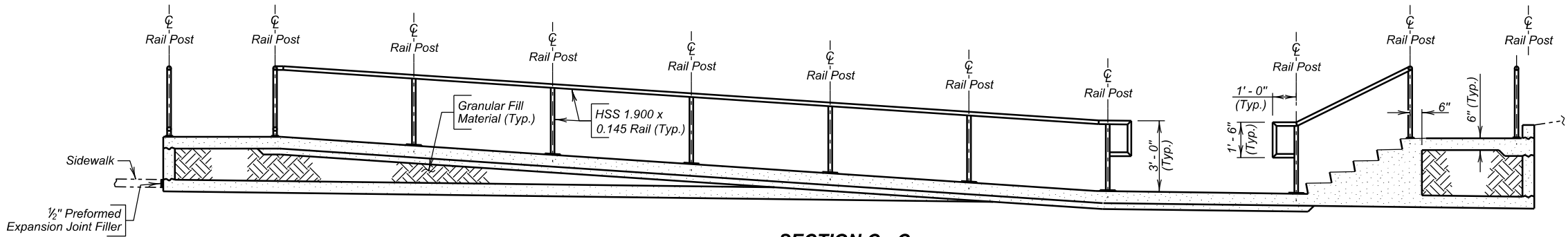
Revised June 16, 2021 AG



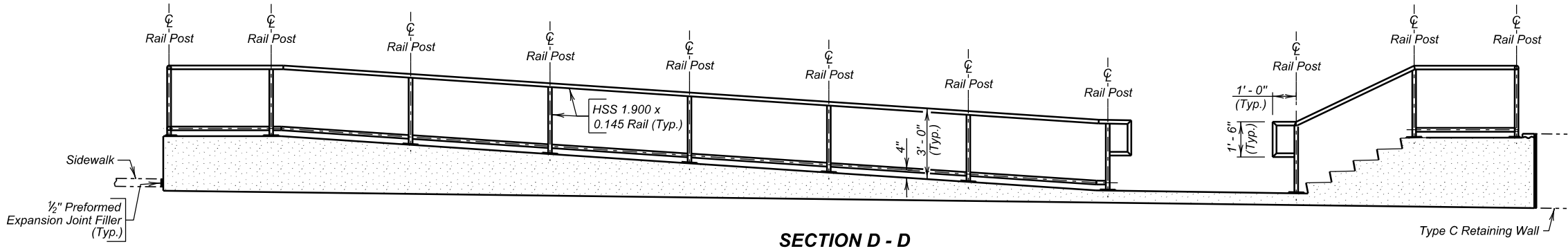
SECTION A - A



SECTION B - B



SECTION C - C



SECTION D - D

**PIPE HANDRAIL**

1. Pipe handrail will not be ordered until the ramps, landings and stairways are constructed and field measurements for in-place length and slope are taken.
2. All rail posts will be built vertical.
3. Steel pipe for railing and posts will conform to ASTM A500, Grade B. Railpost base plates will conform to ASTM A709, Grade 36.
4. The Contractor may use either cast in place anchor bolts or drilled and epoxied anchor rods for anchoring the pipe handrail. Anchor Bolts and nuts will conform to ASTM A307. Anchor rods will conform to ASTM 1554, Grade 36. Washers will be in accordance with ASTM F436. Hardware will be galvanized in accordance with ASTM F2329. Bolts will be hex head "Structural" type with heavy hex, lock nuts, and round washers.
5. All anchor bolts and rods will be tightened to a torque of 120 ft./lbs. (approximated without the use of a calibrated torque wrench).
6. Epoxy will be in accordance with ASTM C881 Type IV. Hole size will be as per the epoxy manufacturer's recommendations. Core bits will not be used to drill anchor rod holes.
7. All steel railing will be galvanized after shop welding in accordance with ASRM A123 and will be painted in accordance with Section 411 of the Specifications and the color will be an approved black (Federal Standard 595B Color 27038). The galvanized steel railing will be cleaned in accordance with ASTM D6386 before painting.
8. Welding and weld inspection will be done in accordance with AWS D1.1-(Current Year) Structural Welding Code - Steel.
9. The cost of structural steel, anchor bolts or anchor rods, painting, galvanizing, welding, weld inspection, and that which is incidental to the fabrication and installation of the Pipe Handrail will be incidental to the contract unit price per foot for "Pipe Handrail".
10. Alternate rail designs, including aluminum rail, may be submitted through proper channels to the Office of Bridge Design for approval.

**RAILING DETAILS AND NOTES  
FOR  
ACCESS RAMP "D"**

IN WINNER  
STA. 64 + 37.66 TO  
STA. 64 + 95.74 - RT.

SEC. 20-T99N-R76W  
NH 0018(191)250

TRIPP COUNTY  
S. D. DEPT. OF TRANSPORTATION  
JANUARY 2021

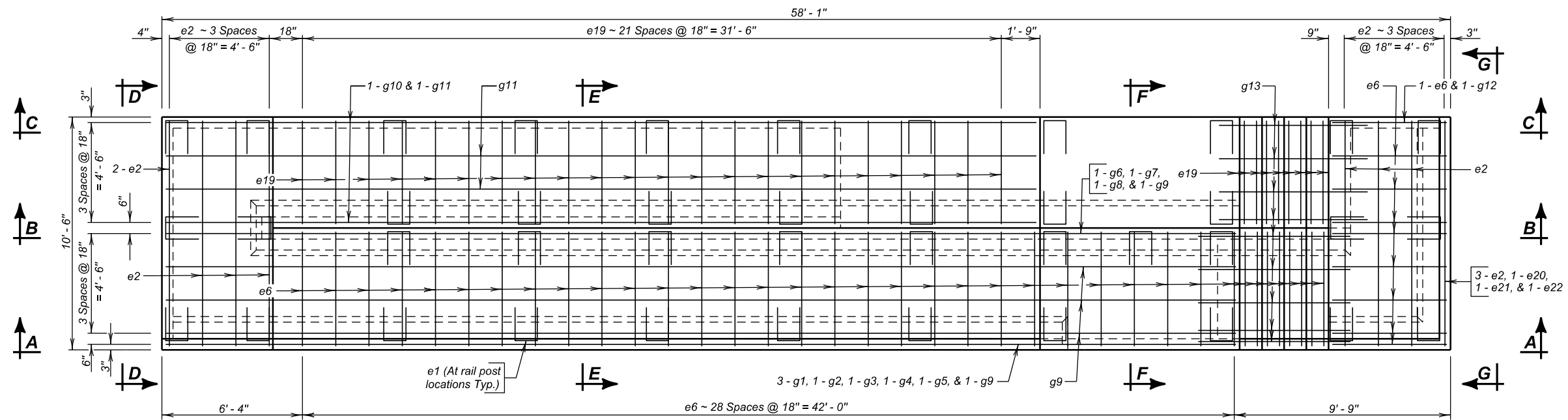
2 OF 6

DESIGNED BY BT TRIP03TK	CK. DES. BY AG 03TKTD02	DRAFTED BY BT Steve A. Johnson	BRIDGE ENGINEER
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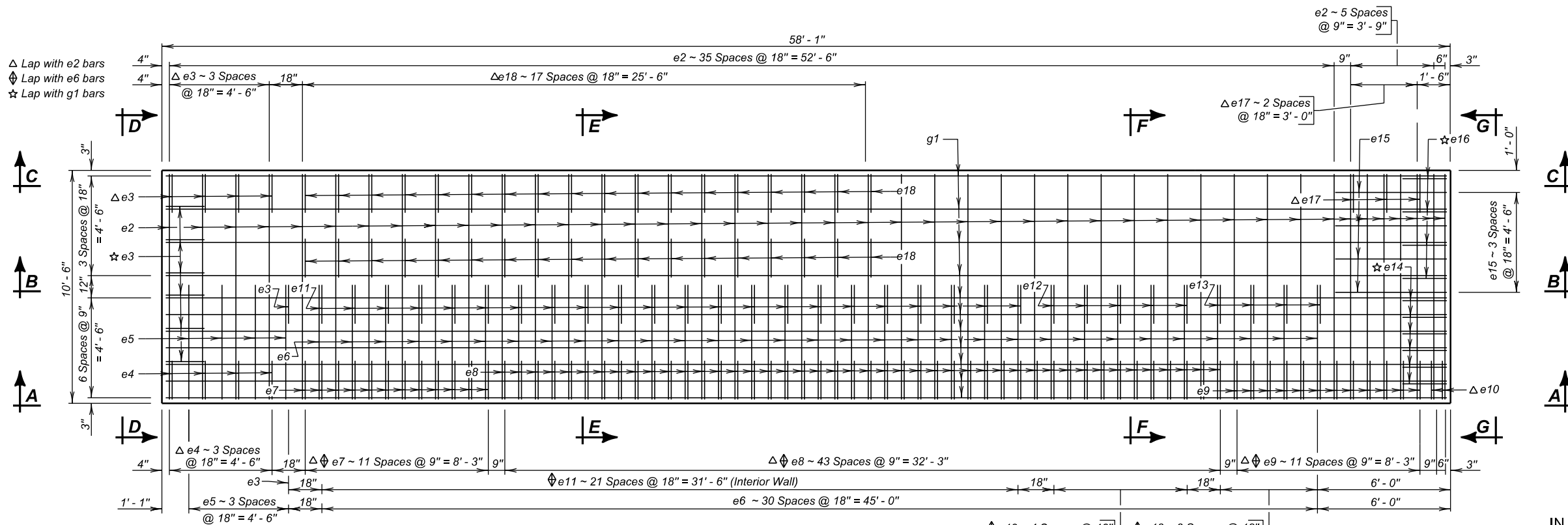


Revised June 16, 2021 AG

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	NH 0018(191)250 P 0044(188)253	B139	B196



PLAN - TOP STEEL



PLAN - BOTTOM STEEL

RAMP DETAILS (A)  
FOR  
ACCESS RAMP "D"

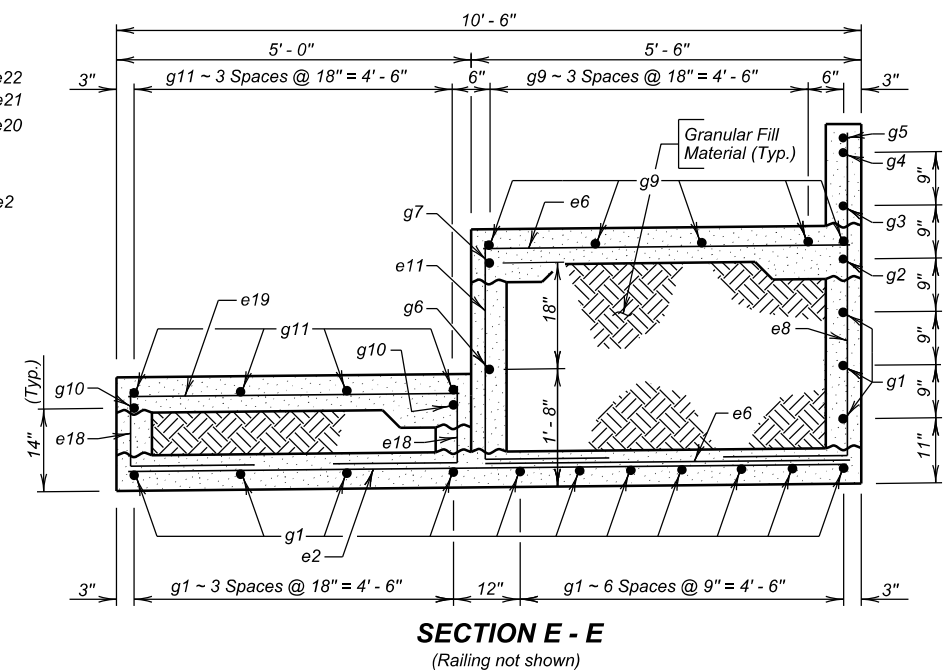
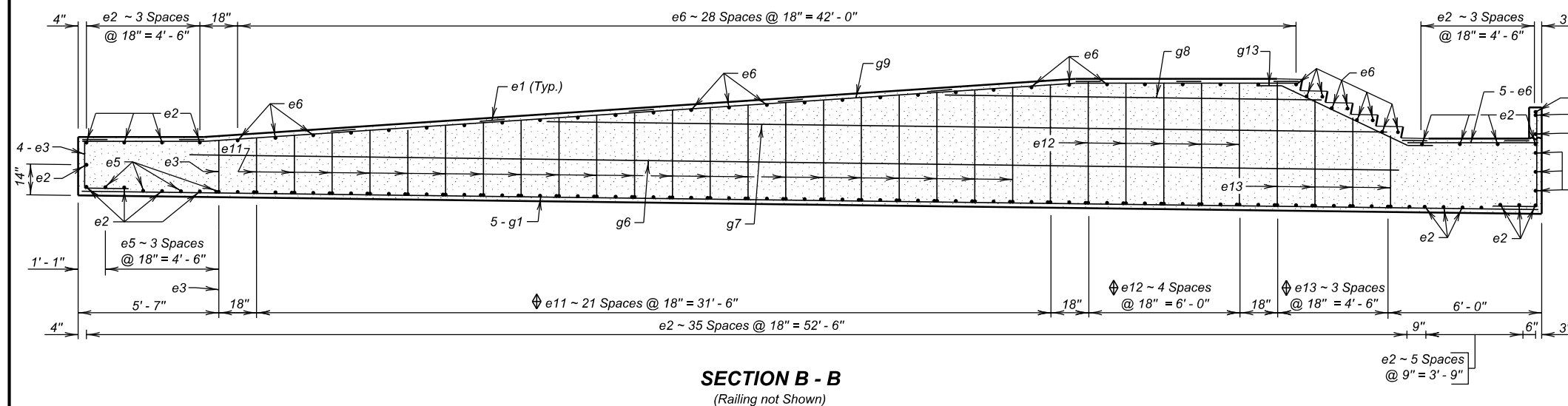
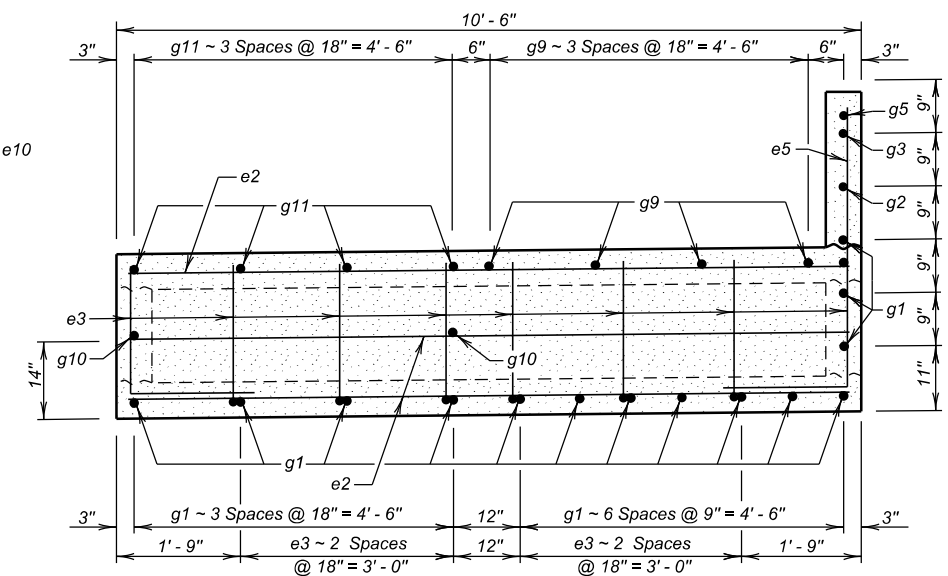
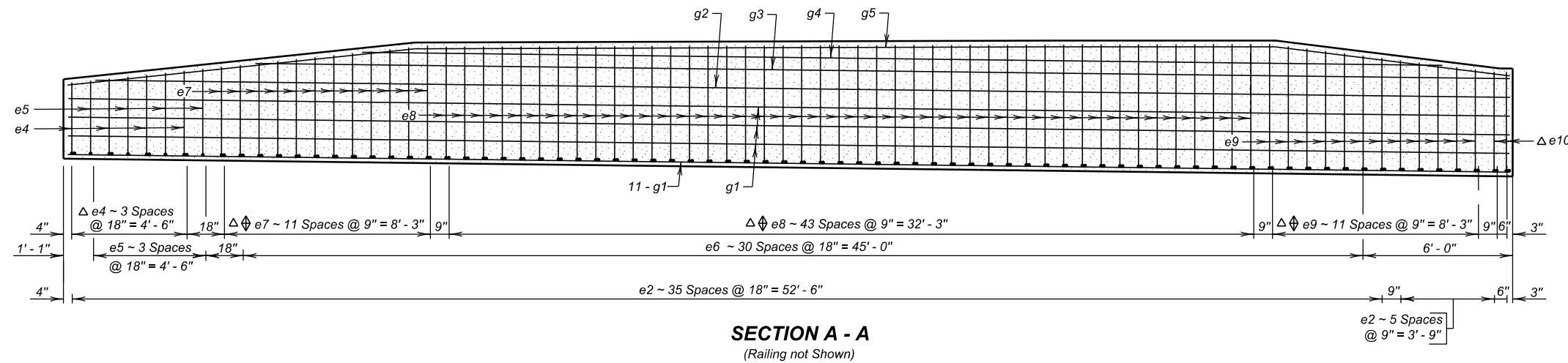
IN WINNER STA. 64 + 37.66 TO  
STA. 64 + 95.74 - RT.

SEC. 20-T99N-R76W  
NH 0018(191)250

TRIPP COUNTY  
S. D. DEPT. OF TRANSPORTATION  
JANUARY 2021

DESIGNED BY BT TRIP03TK	CK. DES. BY AG 03TKTD03	DRAFTED BY BT	Steve A. Johnson BRIDGE ENGINEER
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Δ Lap with e2 bars  
 ◆ Lap with e6 bars



**RAMP DETAILS (B)**  
FOR  
**ACCESS RAMP "D"**

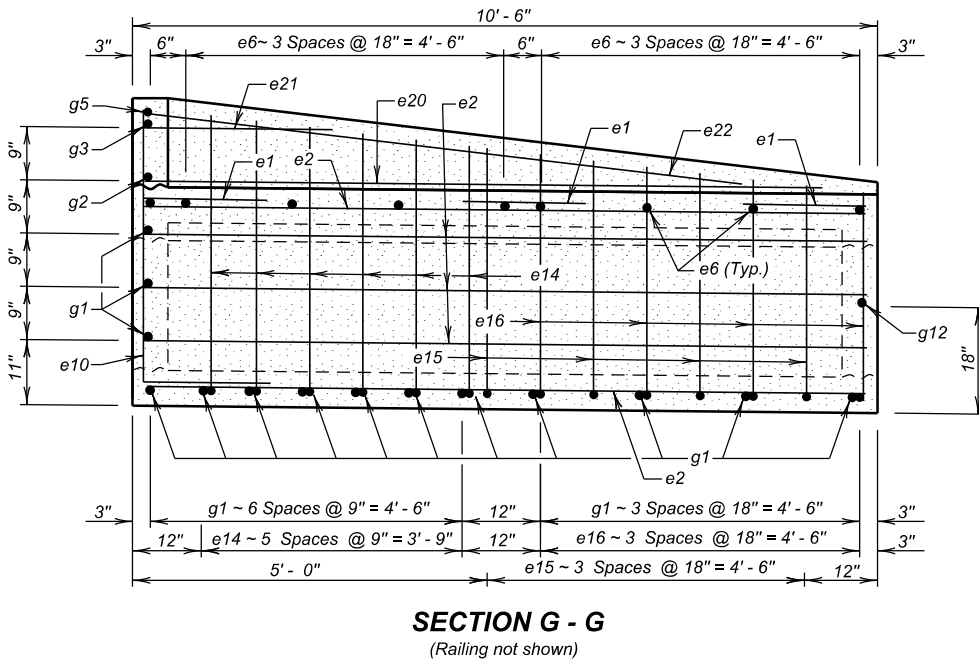
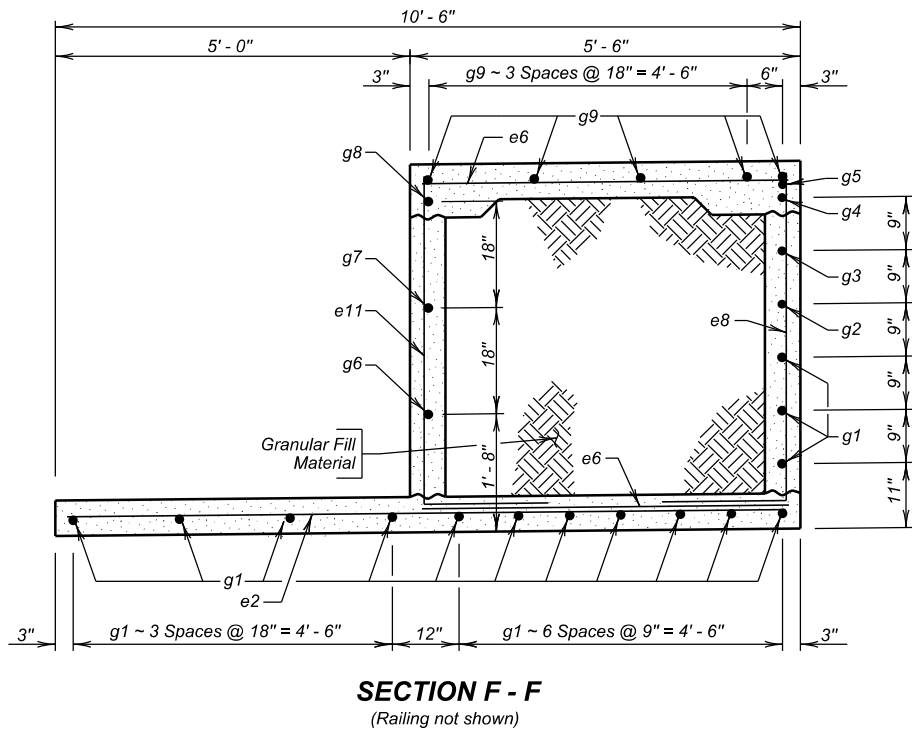
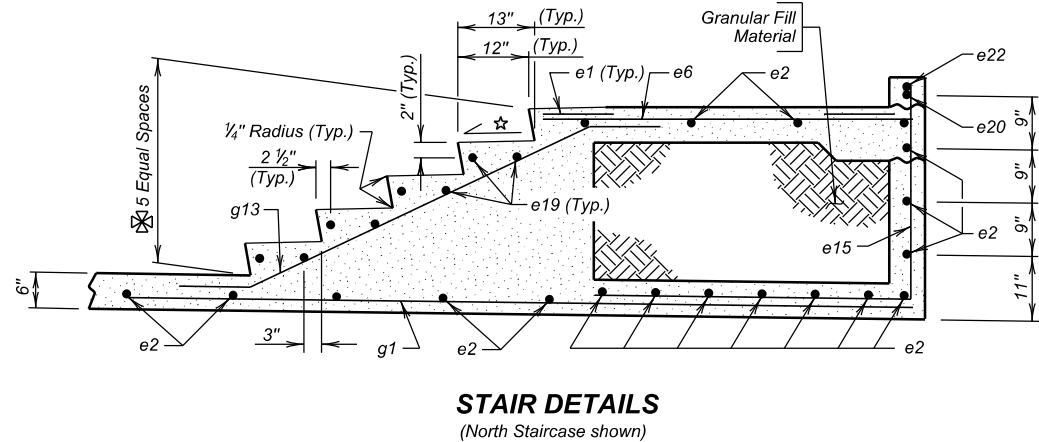
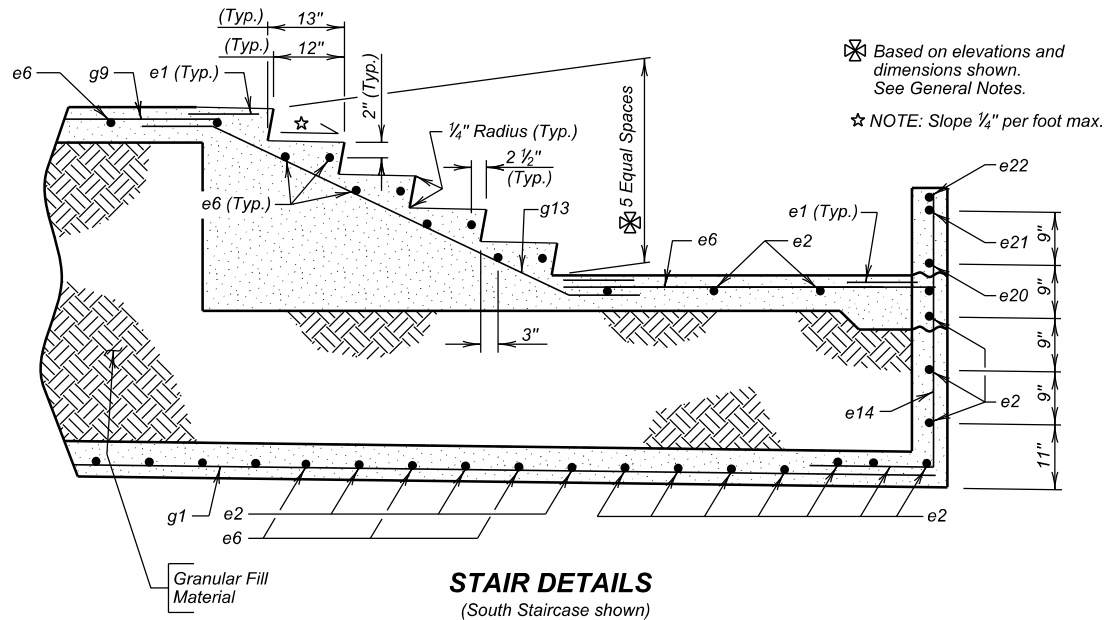
IN WINNER  
STA. 64 + 37.66 TO  
STA. 64 + 95.74 - RT.

SEC. 20-T99N-R76W  
NH 0018(191)250

TRIPP COUNTY  
S. D. DEPT. OF TRANSPORTATION  
JANUARY 2021

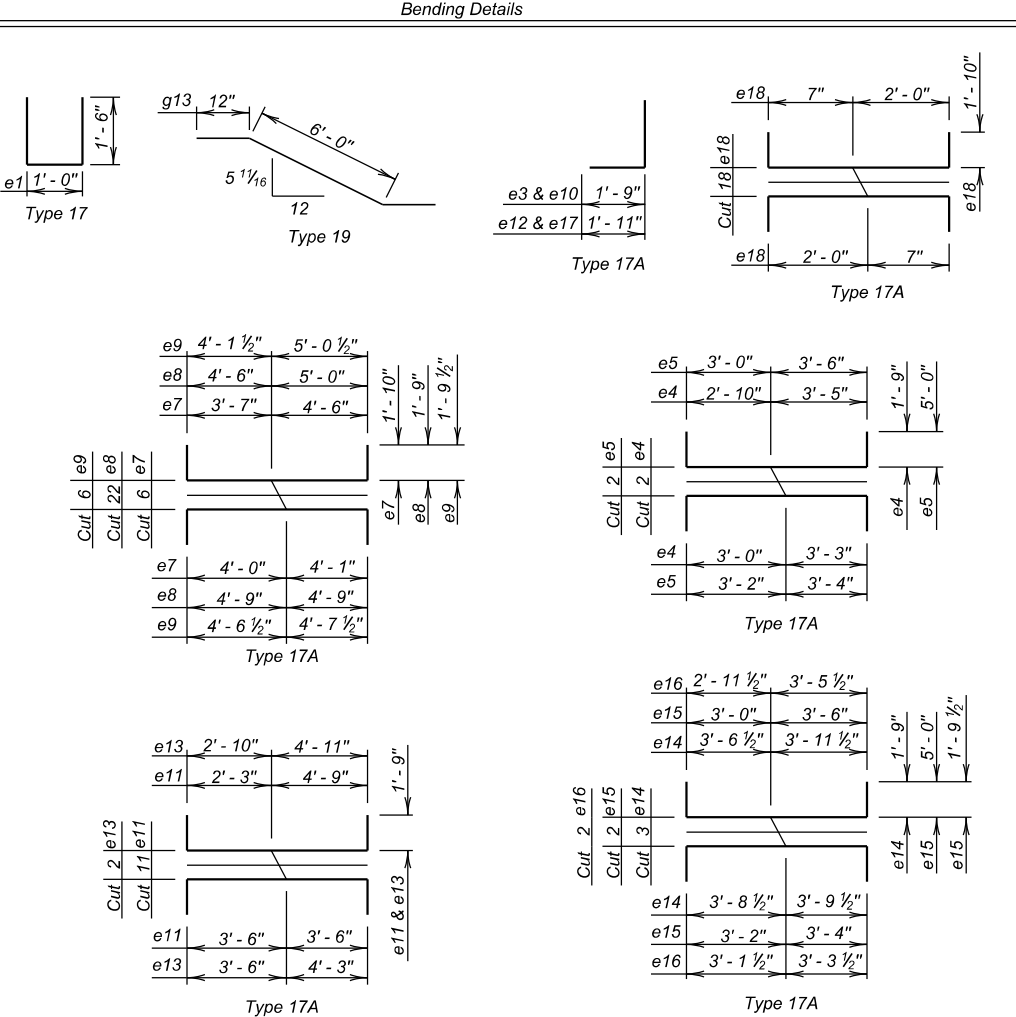
Revised June 16, 2021 AG

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	NH 0018(191)250 P 0044(188)253	B141	B196



**REINFORCING SCHEDULE**

Mk.	No.	Size	Length	Type
⊕	e1	41	4' - 0"	17
⊕	e2	54	4' - 3"	Str.
⊕	e3	11	3' - 9"	17A
⊕	e4	2	9' - 9"	17A
⊕	e5	2	16' - 6"	17A
⊕	e6	77	4' - 3"	Str.
⊕	e7	6	11' - 9"	17A
⊕	e8	22	4' - 3"	17A
⊕	e9	6	12' - 9"	17
⊕	e10	2	4' - 9"	17A
⊕	e11	11	10' - 6"	17A
⊕	e12	5	6' - 9"	17
⊕	e13	2	4' - 3"	17
⊕	e14	3	11' - 0"	17
⊕	e15	2	16' - 6"	17
⊕	e16	2	10' - 0"	17
⊕	e17	3	4' - 9"	17
⊕	e18	18	6' - 3"	17
⊕	e19	30	4' - 9"	Str.
⊕	e20	1	9' - 6"	Str.
⊕	e21	1	2' - 9"	Str.
⊕	e22	1	8' - 6"	Str.
⊕	g1	14	4' - 9"	Str.
⊕	g2	1	56' - 9"	Str.
⊕	g3	1	50' - 3"	Str.
⊕	g4	1	38' - 9"	Str.
⊕	g5	1	58' - 0"	Str.
⊕	g6	1	48' - 6"	Str.
⊕	g7	1	33' - 3"	Str.
⊕	g8	1	12' - 6"	Str.
⊕	g9	5	48' - 3"	Str.
⊕	g10	1	22' - 0"	Str.
⊕	g11	4	39' - 6"	Str.
⊕	g12	1	7' - 0"	Str.
⊕	g13	9	8' - 0"	19



NOTES:  
All dimensions are out to out of bars.  
⊕ See cutting diagram.  
⊗ Bend in field as necessary to fit.

**ESTIMATED QUANTITIES**

ITEM	UNIT	QUANTITY
Class M6 Concrete	Cu. Yd.	33.4
Epoxy Coated Reinforcing Steel	Lb.	2548
Pipe Handrail	Ft.	213
Granular Fill Material	Ton	56.3

\* For estimating purposes only, a factor of 1.89 tons/cu.yd. was used to convert Cu. Yds. to Tons.

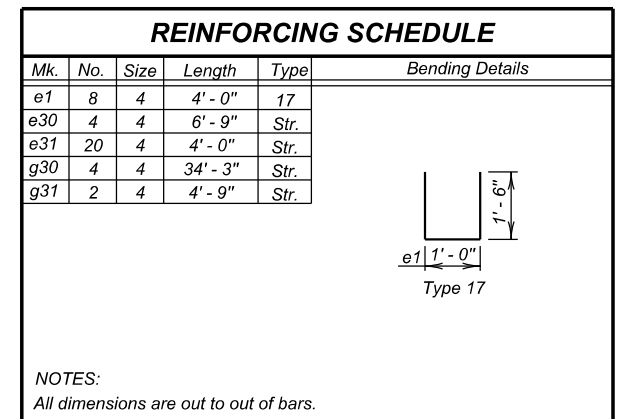
**RAMP DETAILS (C)  
FOR  
ACCESS RAMP "D"**

IN WINNER  
STA. 64 + 37.66 TO  
STA. 64 + 95.74 - RT.

SEC. 20-T99N-R76W  
NH 0018(191)250

TRIPP COUNTY  
S. D. DEPT. OF TRANSPORTATION  
JANUARY 2021

DESIGNED BY BT TRIP03TK	CK. DES. BY AG 03TKTD05	DRAFTED BY BT Steve A. Johnson	BRIDGE ENGINEER
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<b>ESTIMATED QUANTITIES</b>		
<i>ITEM</i>	<i>UNIT</i>	<i>QUANTITY</i>
<i>Class M6 Concrete</i>	<i>Cu. Yd.</i>	<i>3.3</i>
<i>Epoxy Coated Reinforcing Steel</i>	<i>Lb.</i>	<i>191</i>
<i>Pipe Handrail</i>	<i>Ft.</i>	<i>38</i>

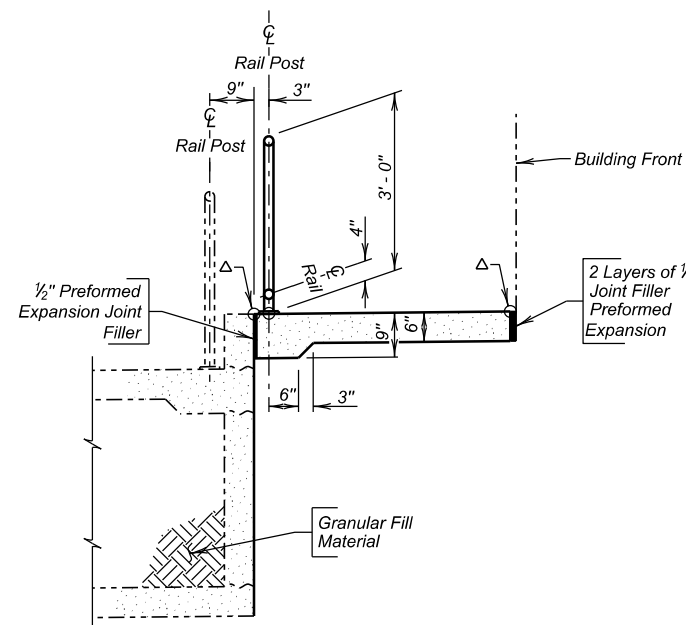
Diagram illustrating a 3-space girder section. The total width is labeled "Varies". The spacing between the three girders is labeled "g30 ~ 3 Spaces @ 15" = 3' - 9"". The distance from the centerline of the outer girders to the centerline of the middle girder is labeled "e1" and "e31". The width of the middle girder is labeled "g30". The width of the outer girders is labeled "3''". The diagram also shows the "Varies" dimension on the right side.

**SECTION G - G**  
(Railing not shown)

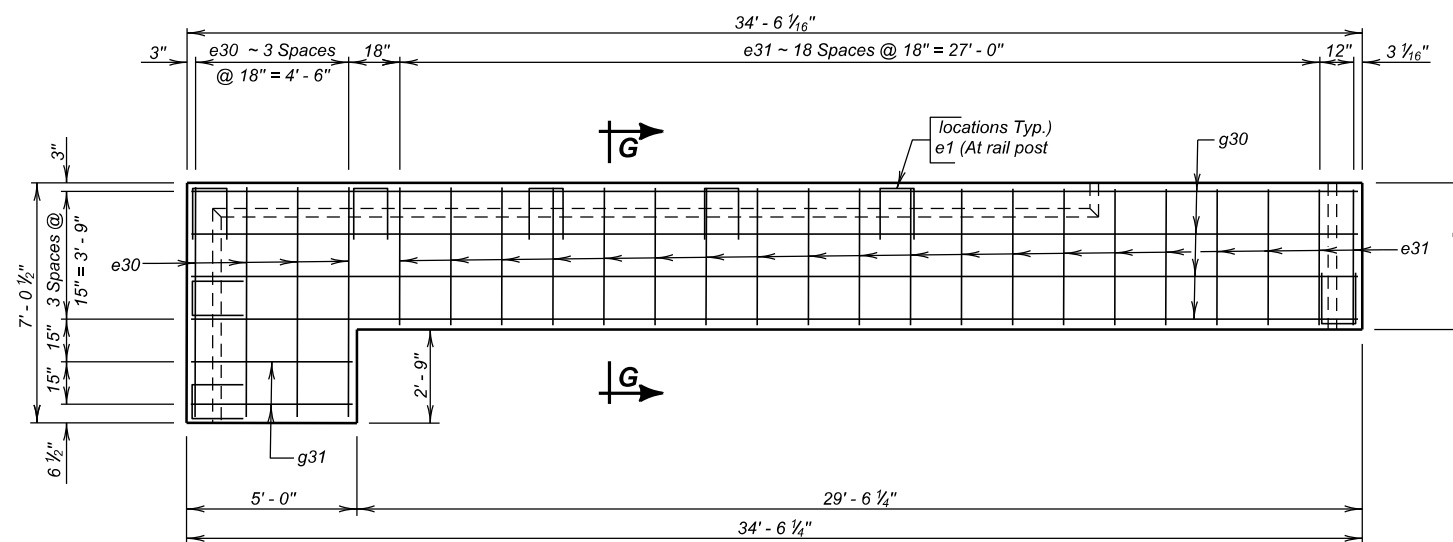
# SIDEWALK DETAILS FOR ACCESS RAMP "D"

SEC. 20-T99N-R76W  
NH 0018(191)250

TRIPP COUNTY  
S. D. DEPT. OF TRANSPORTATION  
JANUARY 2021



**SECTION F - F**  
(Resteel not shown)

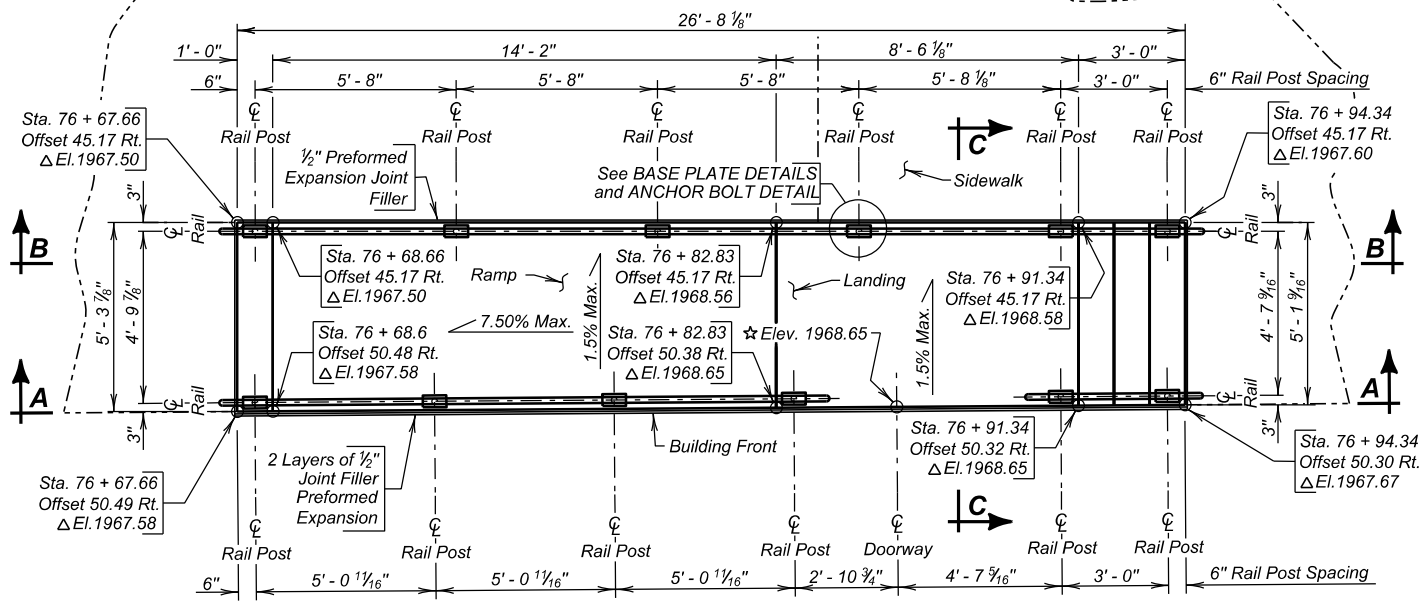
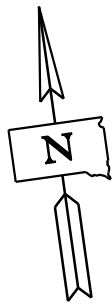


### PLAN

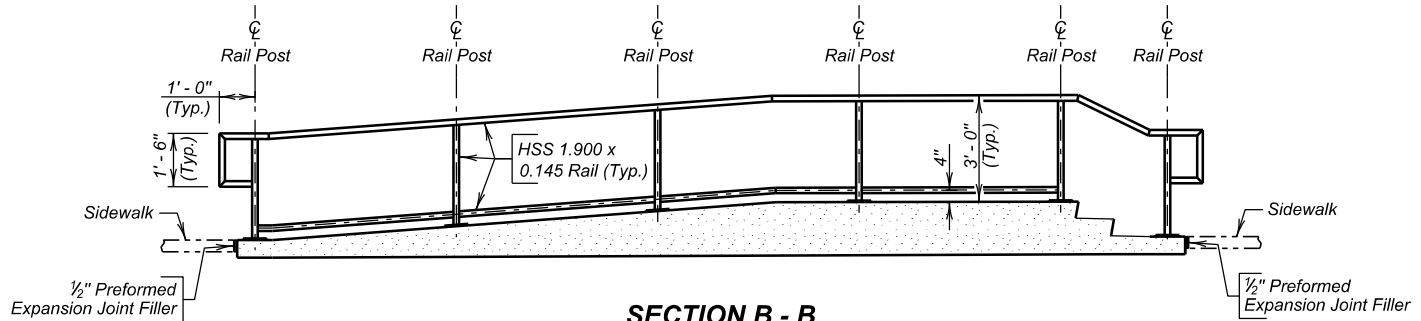
The elevations shown in these plans are based on the National Geodetic Survey (NGS) North American Vertical Datum of 1988 (NAVD88).

Revised June 16, 2021 AG

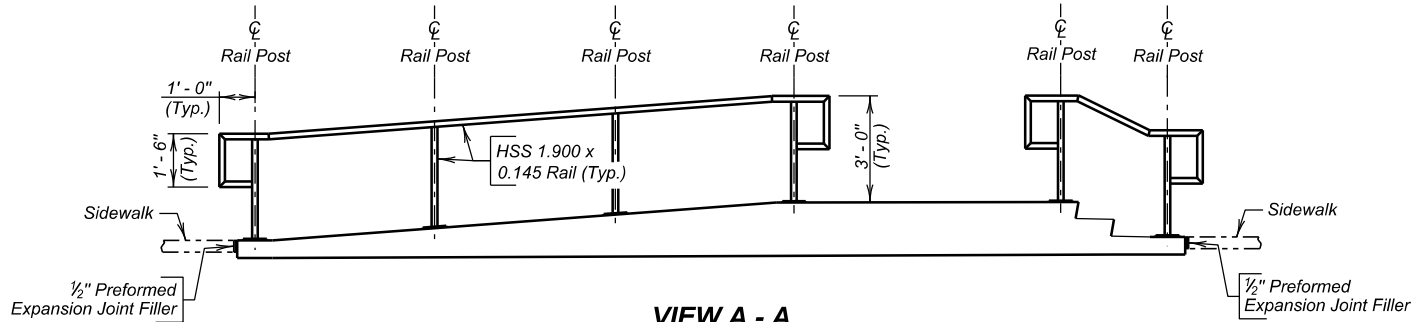
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	NH 0018(191)250 P 0044(188)253	B143	B196



PLAN



SECTION B - B

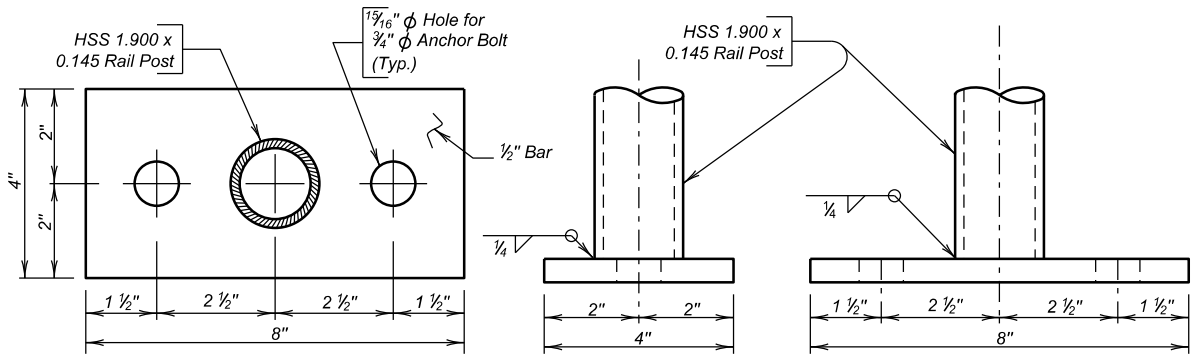


VIEW A - A

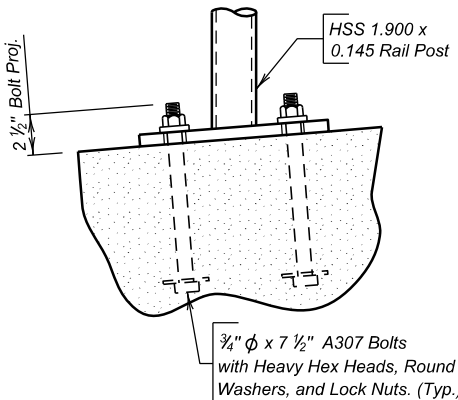
ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Class M6 Concrete	Cu. Yd.	5.7
Epoxy Coated Reinforcing Steel	Lb.	288
Pipe Handrail	Ft.	50

INDEX OF SHEETS-

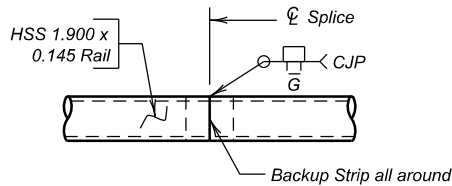
Sheet No. 1 - General Drawing and Notes  
Sheet No. 2 - Ramp Details



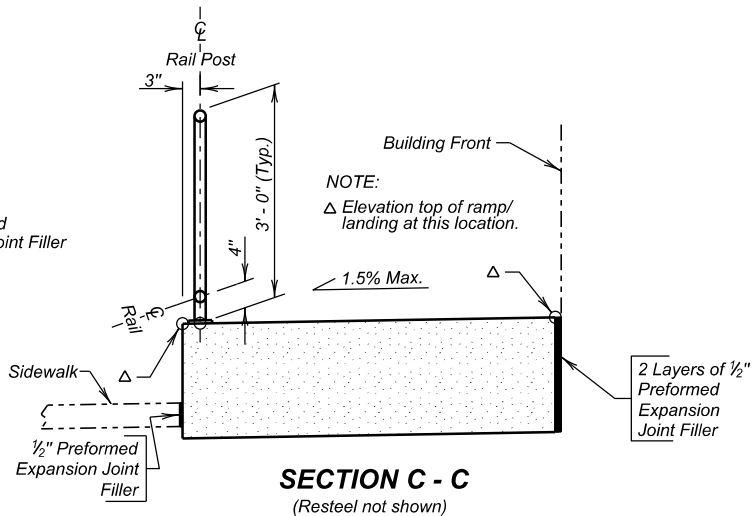
BASE PLATE DETAILS



ANCHOR BOLT DETAIL



RAIL SPLICE DETAILS



SECTION C - C

(Resteel not shown)

SPECIFICATIONS

South Dakota Standard Specifications for Roads and Bridges, Current Edition and required Provisions, Supplemental Specifications and Special Provisions as included in the Proposal.

GENERAL NOTES

1. The plans elevations and slopes shown to construct the ramp and landing are based on the existing doorway threshold elevation. The doorway threshold elevation shall be field verified and if the field verified elevation is different than that shown in the plans adjust ramp and stairway elevations accordingly. If field elevations differ from plans elevations by more than one inch, contact the Bridge Construction Engineer before proceeding with construction.
2. All concrete shall be Class M6 in accordance with Section 462.
3. All reinforcing steel shall be epoxy coated and shall conform to ASTM A615, Grade 60.
4. Use 2" clear cover on all reinforcing steel except as shown.
5. All concrete shall be thoroughly tamped and spaded against forms to leave a smooth surface without honeycomb. All exposed edges shall be chamfered 3/4" except as shown.
6. Place concrete on undisturbed soil. If backfilling is necessary, compact with mechanical tampers to the satisfaction of the Engineer.
7. The concrete sidewalk shall be constructed in accordance with Section 651.
8. Cost of the 1/2" Preformed Expansion Joint Filler shall be incidental to the contract unit price per cubic yard for "Class M6 Concrete".
9. All costs for constructing ramps, stairways and pipe hand railing including labor, material equipment and incidentals necessary to complete the work shall be included in the Class M6 concrete, Epoxy Coated Reinforcing Steel and Pipe Handrail bid items. Payment will be for plans quantities regardless of the quantity actually used.

SHOP PLANS

The fabricator shall submit shop plans in accordance with the Specifications. Shop plan submittals shall be sent to the Office of Bridge Design.

GENERAL DRAWING & QUANTITIES

FOR  
ACCESS RAMP "E"

IN WINNER  
STA. 76 + 67.66 TO  
STA. 76 + 94.34 - RT.  
PCN 03TK

SEC. 20-T99N-R76W  
NH 0018(191)250

TRIPP COUNTY  
S. D. DEPT. OF TRANSPORTATION  
JANUARY 2021

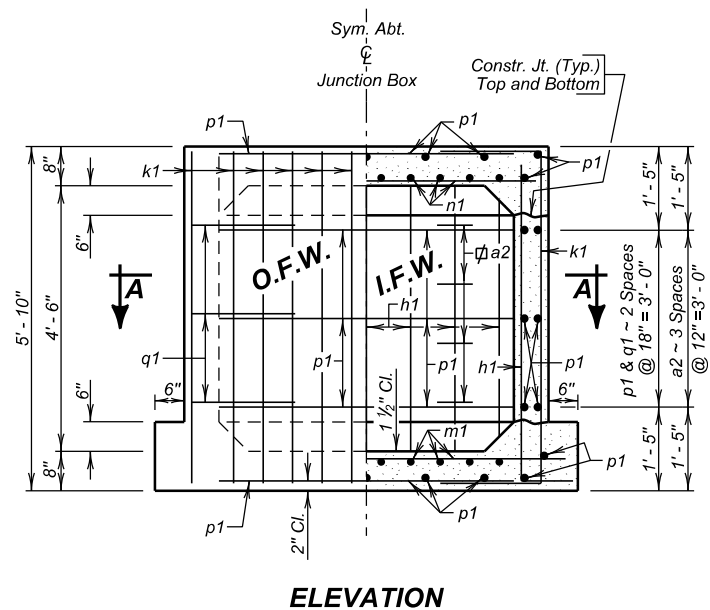
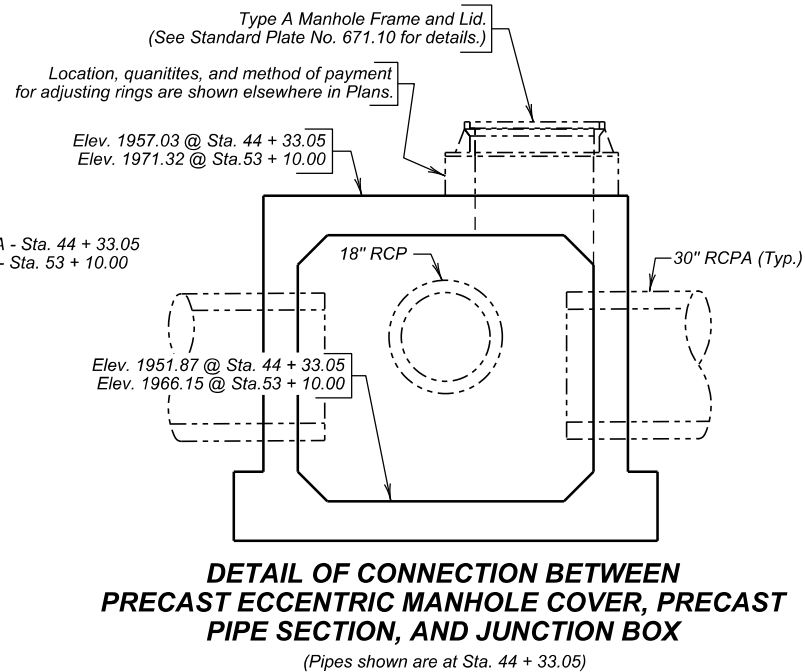
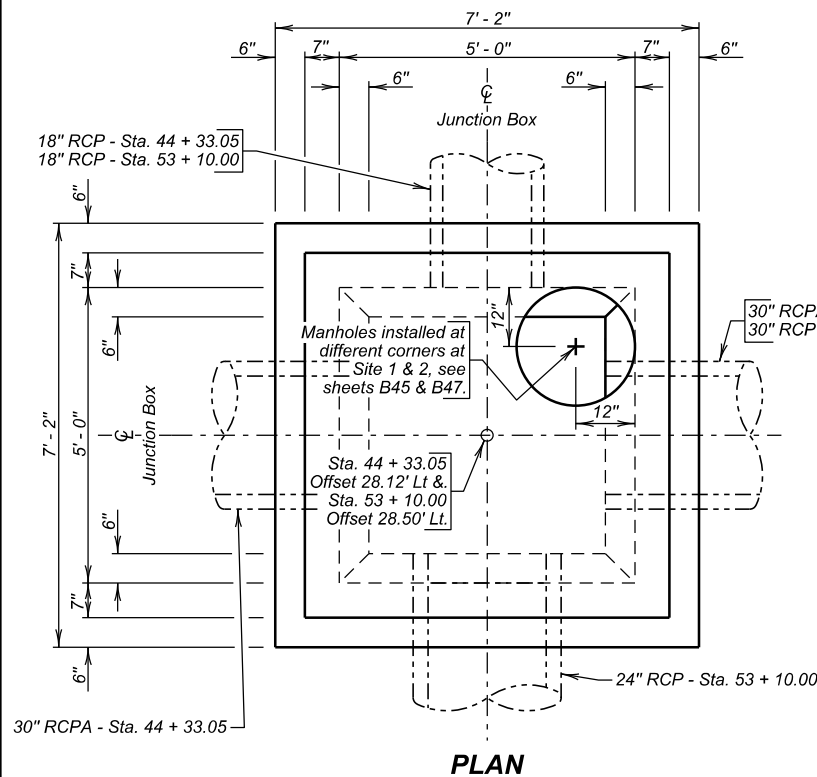
1 OF 2

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

DESIGNED BY	CK. DES. BY	DRAFTED BY	BRIDGE ENGINEER
BT TRIP03TK	AG 03TKTD01	BT	Steve A. Johnson



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



	STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
	S.D.	NH 0018(191)250 P 0044(188)253	B145	B196

## REINFORCING SCHEDULE

Mk.	No.	Size	Length	Type	Bending Details
a1	1	6	9' - 0"	T3	
a2	4	-	-----	-	
h1	28	4	6' - 3"	17A	
k1	44	4	9' - 0"	17	
m1	20	5	6' - 9"	Str	
n1	20	5	5' - 9"	Str.	
p1	60	4	5' - 0"	Str.	
q1	12	4	3' - 6"	17A	

**NOTES:**

All dimensions are out to out of bars.

★ Locate in center of top slab with 3" clearance at the manhole opening.

☐ Cast Iron Manhole Steps (R-1980-C) from Neenah Foundry or equivalent.

## ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY
Class M6 Concrete	Cu. Yd.	4.6
Reinforcing Steel	Lb.	884
Type A10 Manhole Frame and Lid	Each	1

## SPECIFICATIONS

1. *Design Specifications: AASHTO LRFD Bridge Design Specifications, 9th Edition.*
2. *Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, 2015 Edition and required Provisions, Supplemental Specifications, and Special Provisions as included in the Proposal.*

## GENERAL NOTES

1. Design Live Load: HL-93. No construction loading in excess of legal load was considered.
2. The design of the Junction Box is based on a maximum fill over the Junction Box of 5 feet and minimum fill over the Junction Box is 0 feet.
3. Reinforcing steel will conform to ASTM A615 Grade 60. Cut and bend reinforcing steel as required to place pipe(s) thru junction box wall.
4. Junction Box may be precast. If precast, submit a checked design (done by a South Dakota registered P.E.) and shop plans to the Office of Bridge Design for approval.
5. Use 1 inch clear cover on all reinforcing steel unless otherwise noted.
6. All exposed edges will be chamfered  $\frac{3}{4}$  inch.
7. Junction Box shown may be modified by the addition or omission of connecting pipes as noted elsewhere in the plans. All pipes entering Junction Box must fit between the inside face of walls.
8. The cost of furnishing and installing the manhole steps will be incidental to the contract unit price per Lb. for "Reinforcing Steel".
- \* 9. Reduce total quantities of concrete by the amount of concrete displaced by the pipes. The total quantity of concrete will be computed to the nearest hundredth of a cubic yard. The total quantity of reinforcing steel will be computed to the nearest pound.

## SITE 1 & 2

## DETAILS

FOR

"SPECIAL" 5' X 5' JUNCTION BOX

## IN WINNER

NH 0018(191)250

STA. 44 + 33.05 - 28.12' LT. &

STA. 53 + 10.00 - 28.50' LT.

PCN 03TK


TRIPP COUNTY

S. D. DEPT. OF TRANSPORTATION

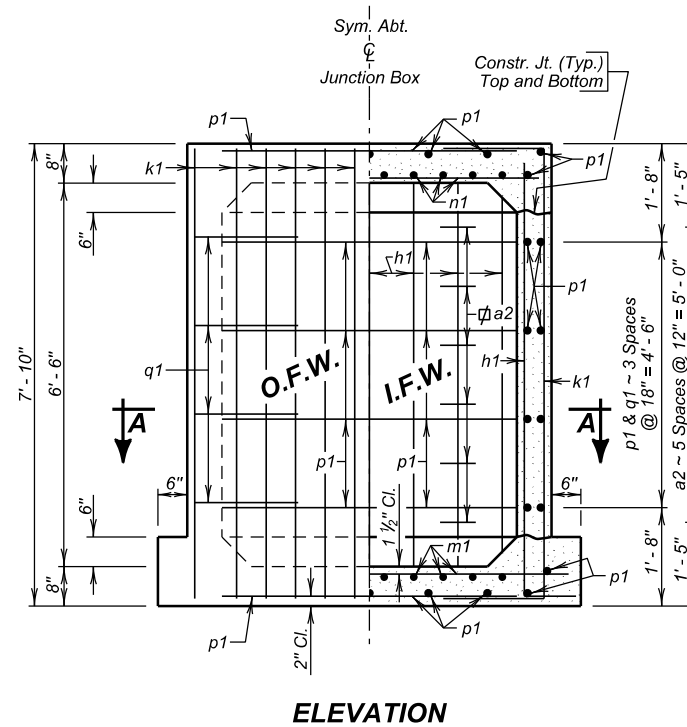
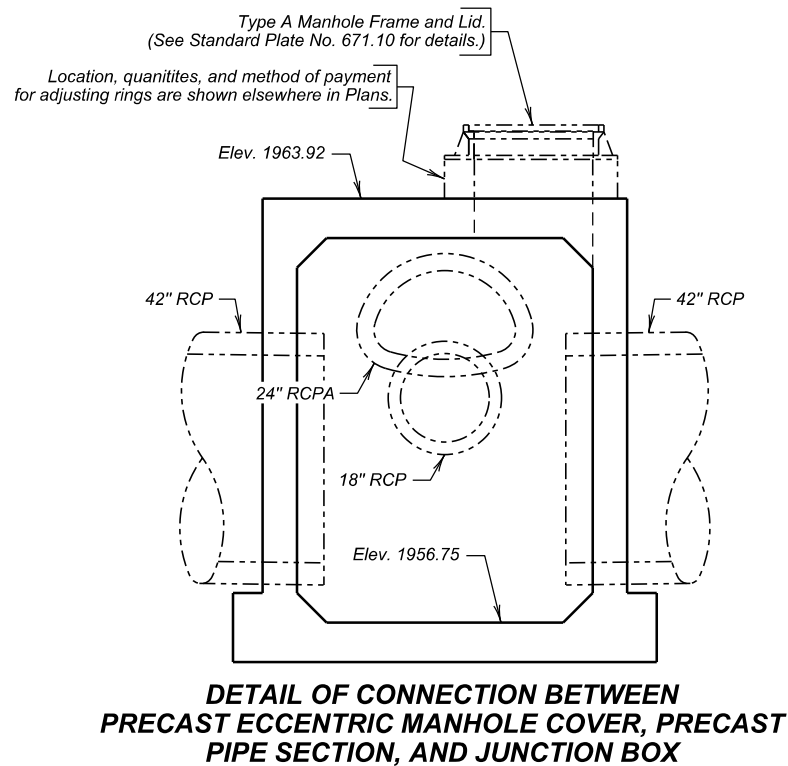
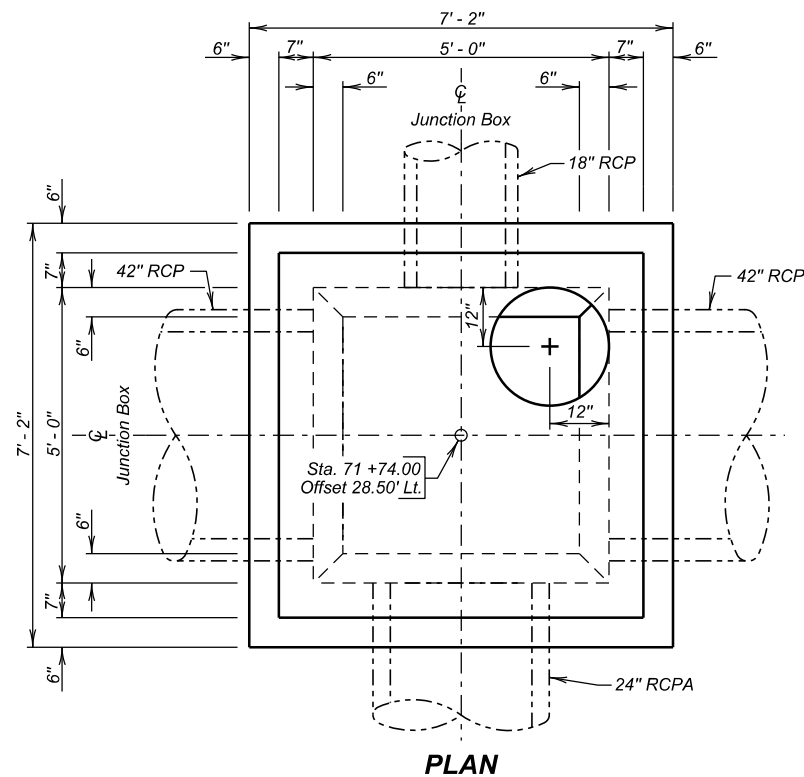
JANUARY 2021

1 OF 1

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

DESIGNED BY AG	CK. DES. BY HS	DRAFTED BY BT	 BRIDGE ENGINEER
TRIP03TK	03TKTA01		

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



	STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
	S.D.	NH 0018(191)250 P 0044(188)253	B146	B196

## REINFORCING SCHEDULE

Mk.	No.	Size	Length	Type	Bending Details
a1	1	6	9' - 0"	T3	
a2	6	-	-----	-	
h1	28	4	8' - 3"	17A	
k1	44	4	11' - 0"	17	
m1	20	5	6' - 9"	Str	
n1	20	5	5' - 9"	Str.	
p1	68	4	5' - 0"	Str.	
q1	16	4	3' - 6"	17A	

**NOTES:**  
 All dimensions are out to out of bars.

★ Locate in center of top slab with 3" clearance at the manhole opening.

⌘ Cast Iron Manhole Steps (R-1980-C) from Neenah Foundry or equivalent.

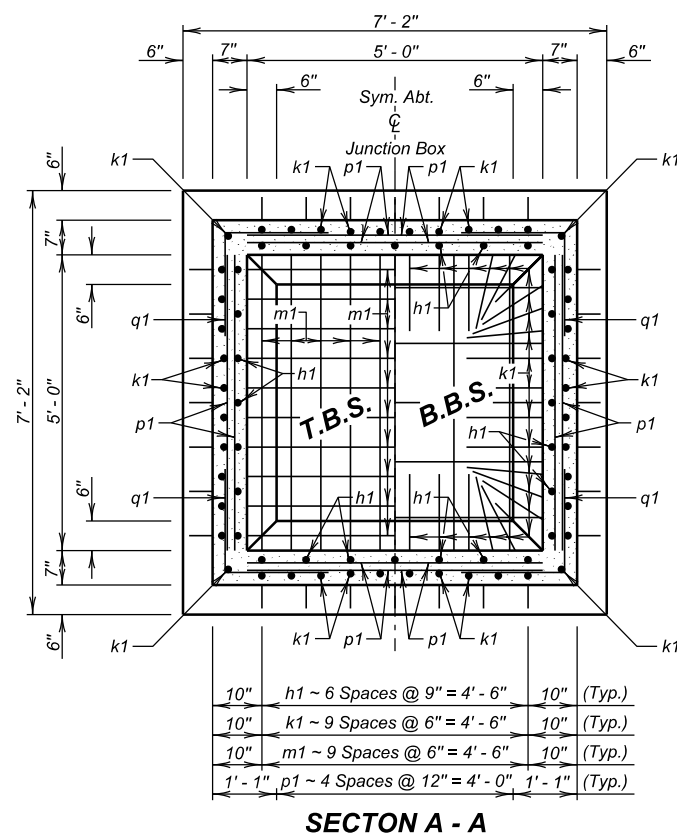
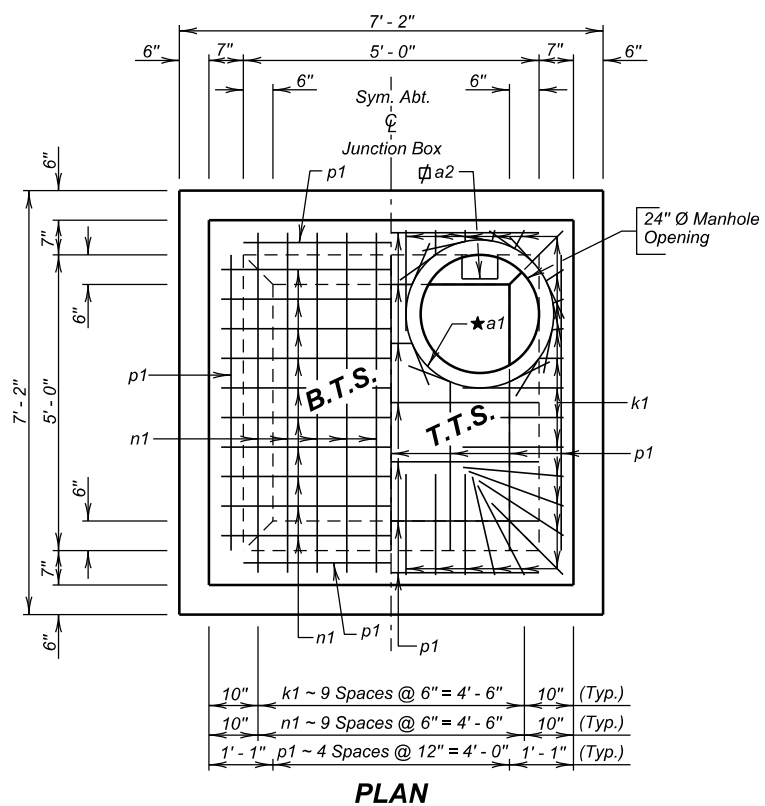
ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Class M6 Concrete	Cu. Yd.	5.5
Reinforcing Steel	Lb.	1016
Type A10 Manhole Frame and Lid	Each	1

## SPECIFICATIONS

1. *Design Specifications: AASHTO LRFD Bridge Design Specifications, 9th Edition.*
2. *Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, 2015 Edition and required Provisions, Supplemental Specifications, and Special Provisions as included in the Proposal.*

## GENERAL NOTES

1. Design Live Load: HL-93. No construction loading in excess of legal load was considered.
2. The design of the Junction Box is based on a maximum fill over the Junction Box of 5 feet and minimum fill over the Junction Box is 0 feet.
3. Reinforcing steel will conform to ASTM A615 Grade 60. Cut and bend reinforcing steel as required to place pipe(s) thru junction box wall.
4. Junction Box may be precast. If precast, submit a checked design (done by a South Dakota registered P.E.) and shop plans to the Office of Bridge Design for approval.
5. Use 1 inch clear cover on all reinforcing steel unless otherwise noted.
6. All exposed edges will be chamfered  $\frac{3}{4}$  inch.
7. Junction Box shown may be modified by the addition or omission of connecting pipes as noted elsewhere in the plans. All pipes entering Junction Box must fit between the inside face of walls.
8. The cost of furnishing and installing the manhole steps will be incidental to the contract unit price per Lb. for "Reinforcing Steel".
- ★ 9. Reduce total quantities of concrete by the amount of concrete displaced by the pipes. The total quantity of concrete will be computed to the nearest hundredth of a cubic yard. The total quantity of reinforcing steel will be computed to the nearest pound.



<b>PIPE DISPLACEMENT REDUCTIONS</b>		
<b>R.C. Pipe Diameter (Inches)</b>	<b>Thickness of Pipe (Inches)</b>	<b>Class M6 Concrete (Cu. Yd.)</b>
<b>18" R.C.P.</b>	<b>2 ½</b>	<b>0.06</b>
<b>24" R.C.P.A.</b>	<b>3 ½</b>	<b>0.11</b>
<b>42" R.C.P.</b>	<b>4 ½</b>	<b>0.31</b>

<b>LEGEND FOR PLACING RE-STEEL</b>
<i>T.T.S. - Top of Top Slab</i>
<i>B.T.S. - Bottom of Top Slab</i>
<i>T.B.S. - Top of Bottom Slab</i>
<i>B.B.S. - Bottom of Bottom Slab</i>
<i>O.F.W. - Outside Face of Wall</i>
<i>I.F.W. - Inside Face of Wall</i>

## SITE 3

## DETAILS

FOR

"SPECIAL" 5' X 5' JUNCTION BOX

## IN WINNER

NH 0018(191)250

STA. 71 + 74.00 - 28.50' LT.

PCN 03TK


TRIPP COUNTY

S. D. DEPT. OF TRANSPORTATION

JANUARY 2021

1 OF 1

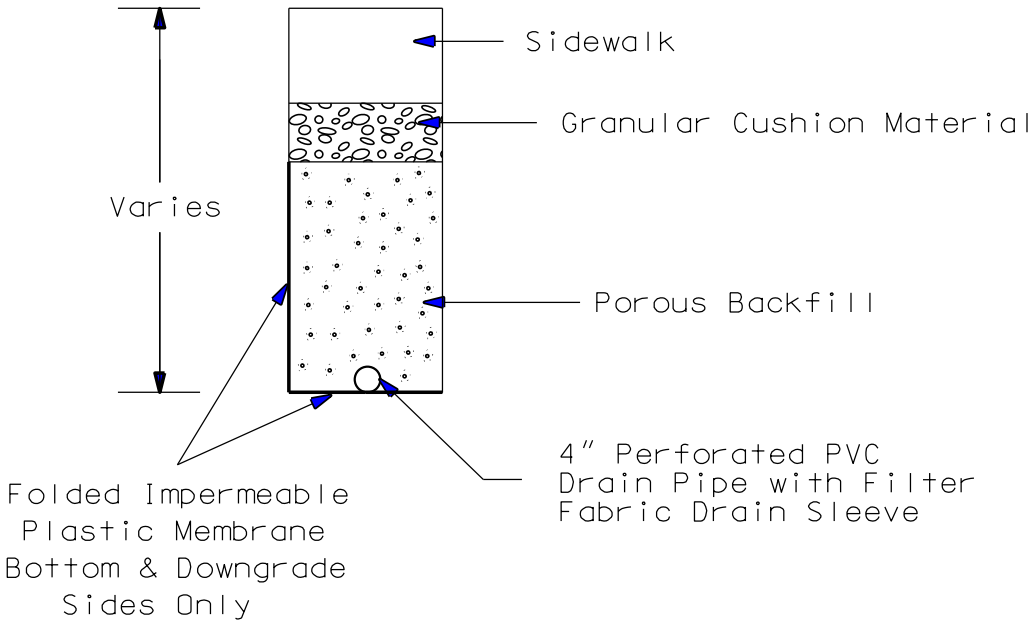
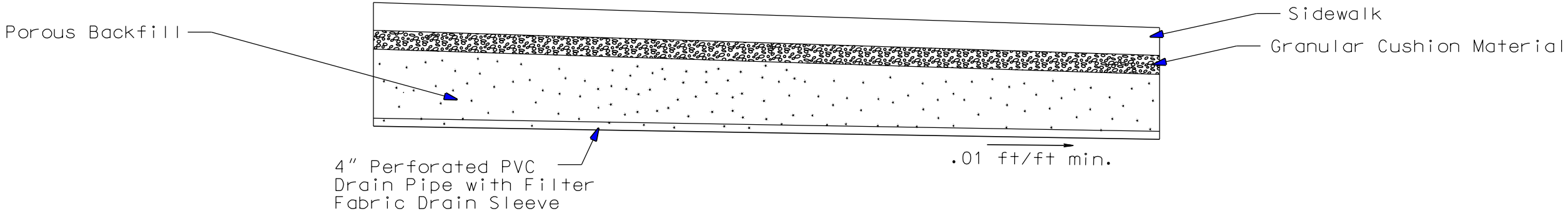
PLANS BY:  
OFFICE OF BRIDGE DESIGN, SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION

DESIGNED BY AG	CK. DES. BY HS	DRAFTED BY BT	 BRIDGE ENGINEER
TRIP03TK	03TKTA01		



# TYPICAL CUTOFF DRAIN INSTALLATION

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0018(191)250 P 0044(188)253		
Plotting Date: 02/18/2021		B147	B196



4" Perforated PVC Drain Pipe will be SDR 35 perforated solvent weld PVC pipe conforming to ASTM D3034.

Plot Scale - 1:5

Plotted From - TRPR14341

File - ...Cutoff Drain Details 03TK.dgn

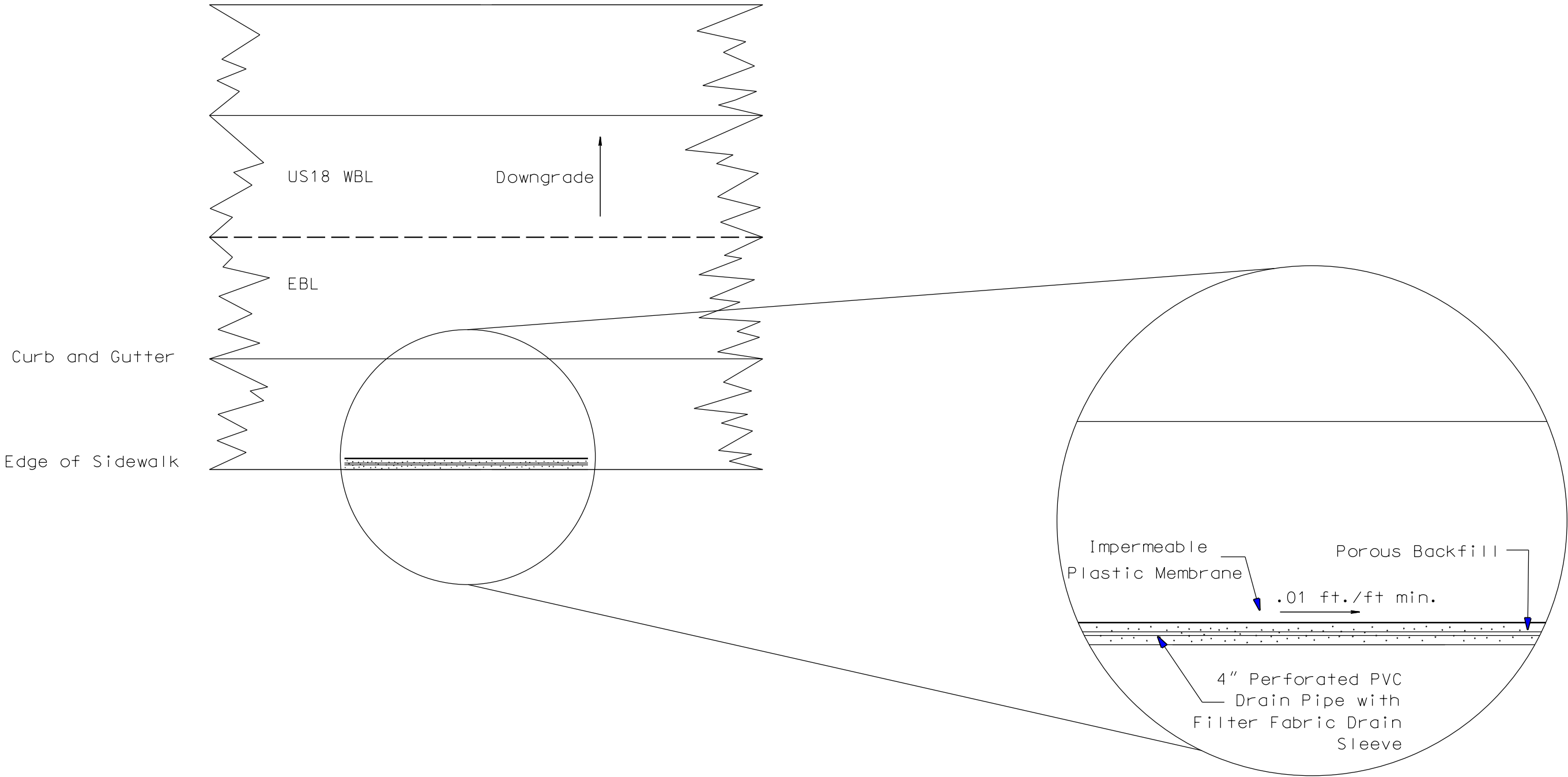
# TYPICAL CUTOFF DRAIN INSTALLATION

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0018(191)250 P 0044(188)253		
Plotting Date:		B148	B196

05/17/2021

Plot Scale - 1:5

Plotted From - TRPR14341



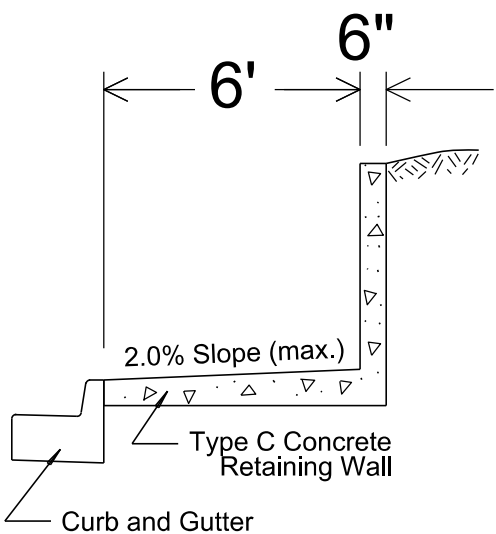
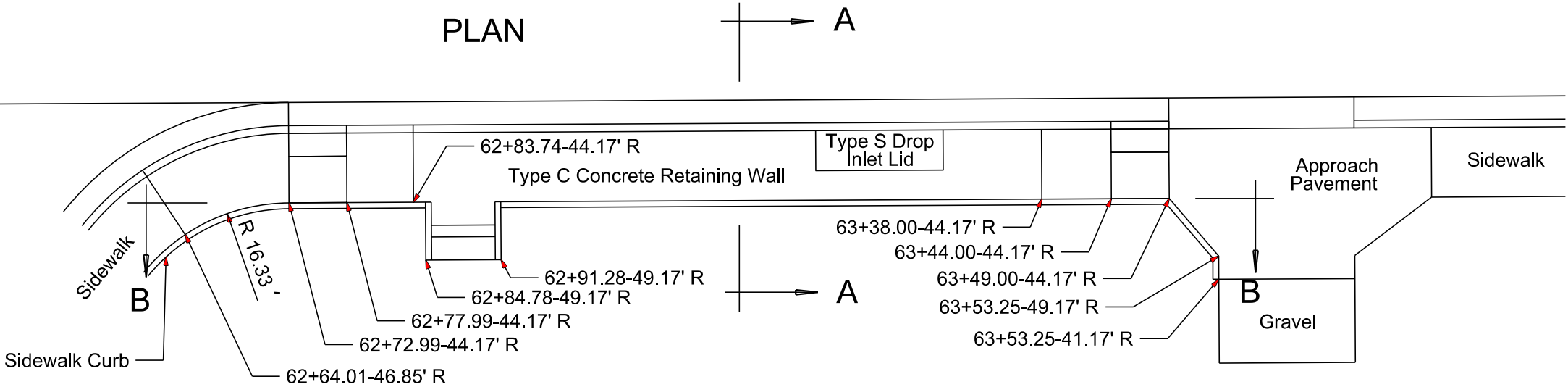
# RETAINING WALL LAYOUT

62+64.01-46.85' R to 63+53.25-51.17' R

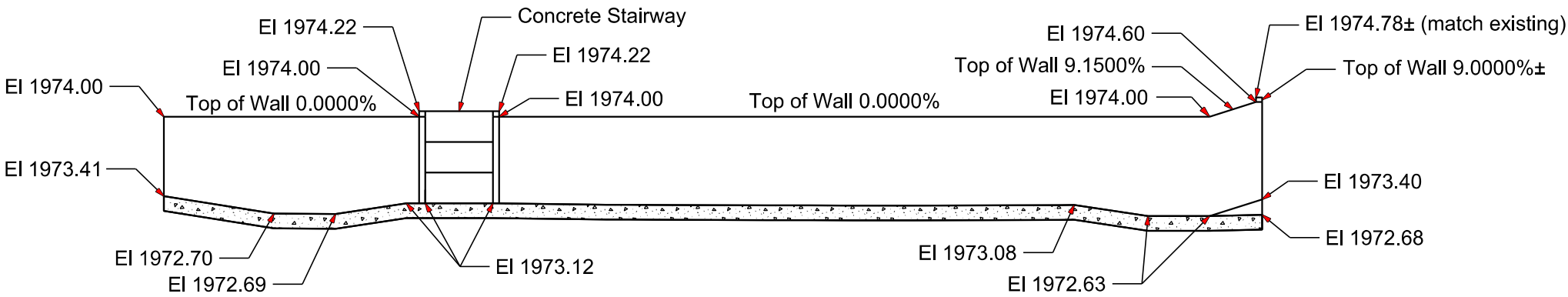
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0018(191)250 P 0044(188)253	B149	B196

Plotting Date: 02/18/2021

PLAN



SEC. A-A



SEC. B-B

Plot Scale - 1:12

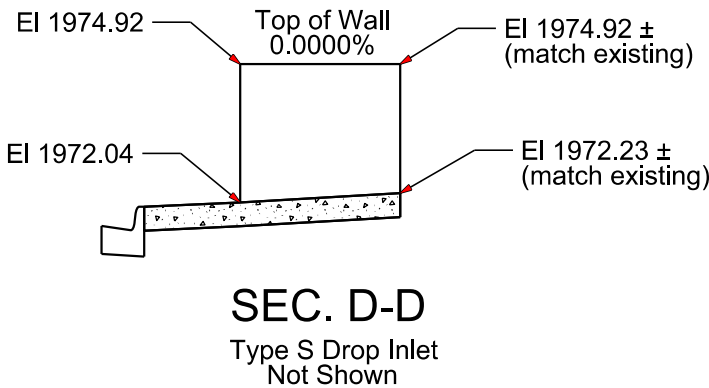
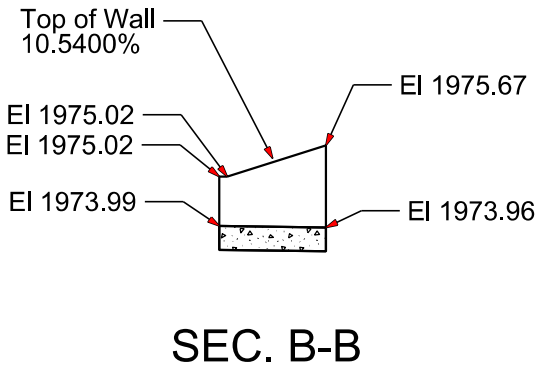
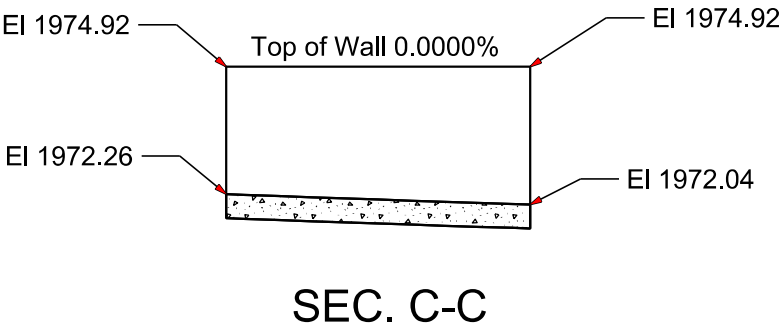
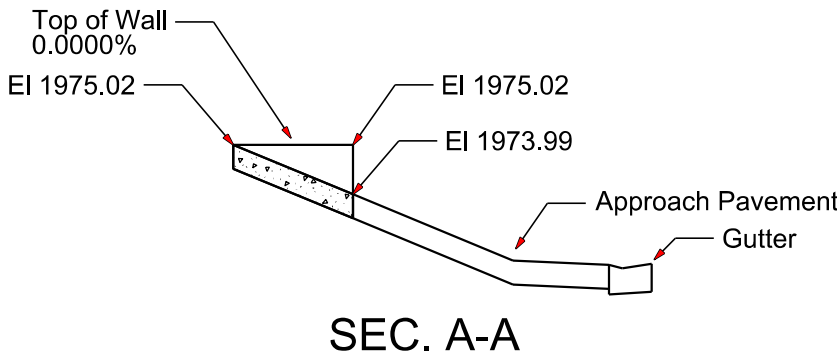
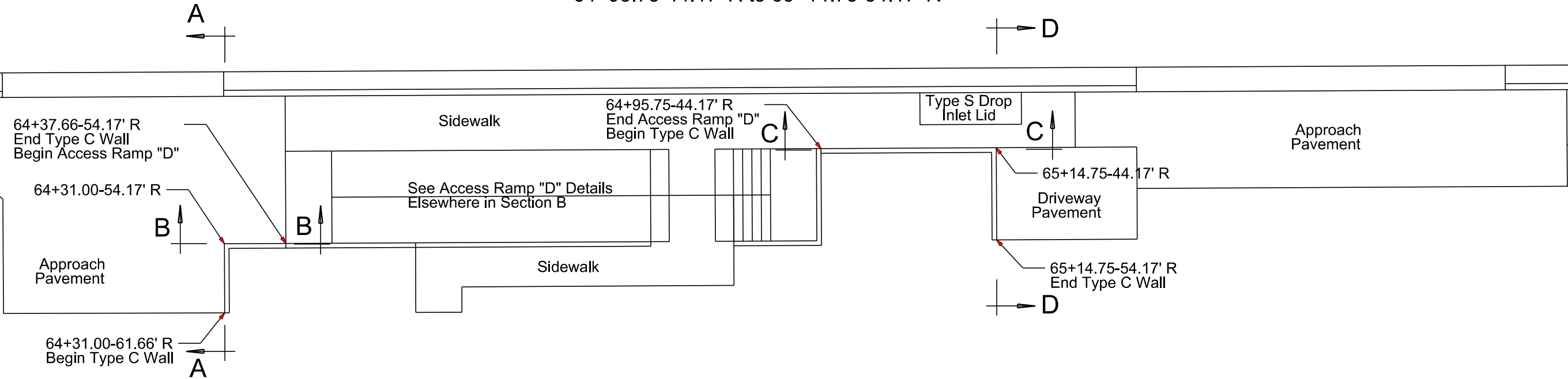
Plotted From - TRPR14341

# RETAINING WALL LAYOUT

64+31.00-61.66' R to 64+37.66-54.17' R  
&  
64+95.75-44.17' R to 65+14.75-54.17' R

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0018(191)250 P 0044(188)253	B150	B196

Plotting Date: 03/26/2021

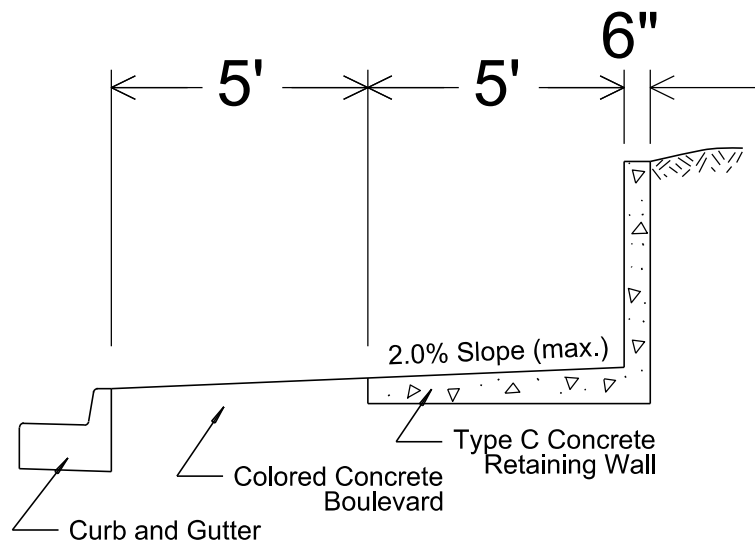
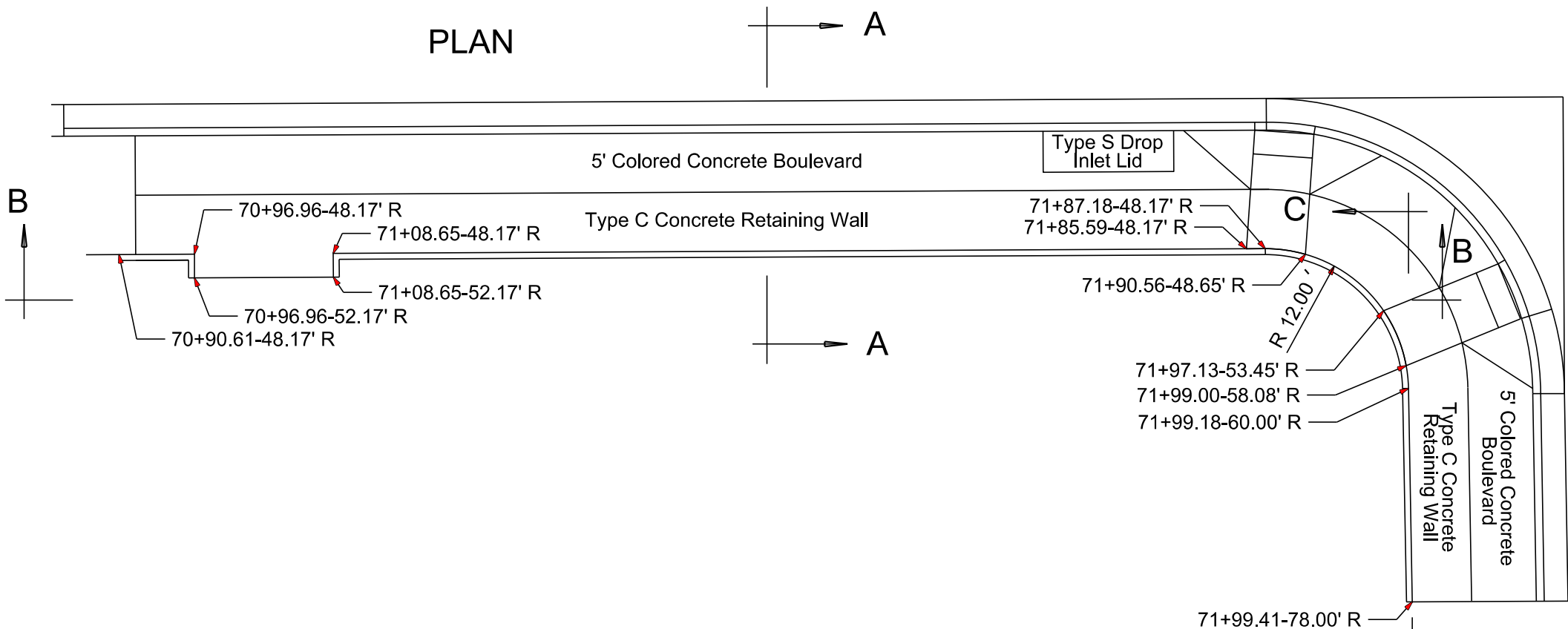


# RETAINING WALL LAYOUT

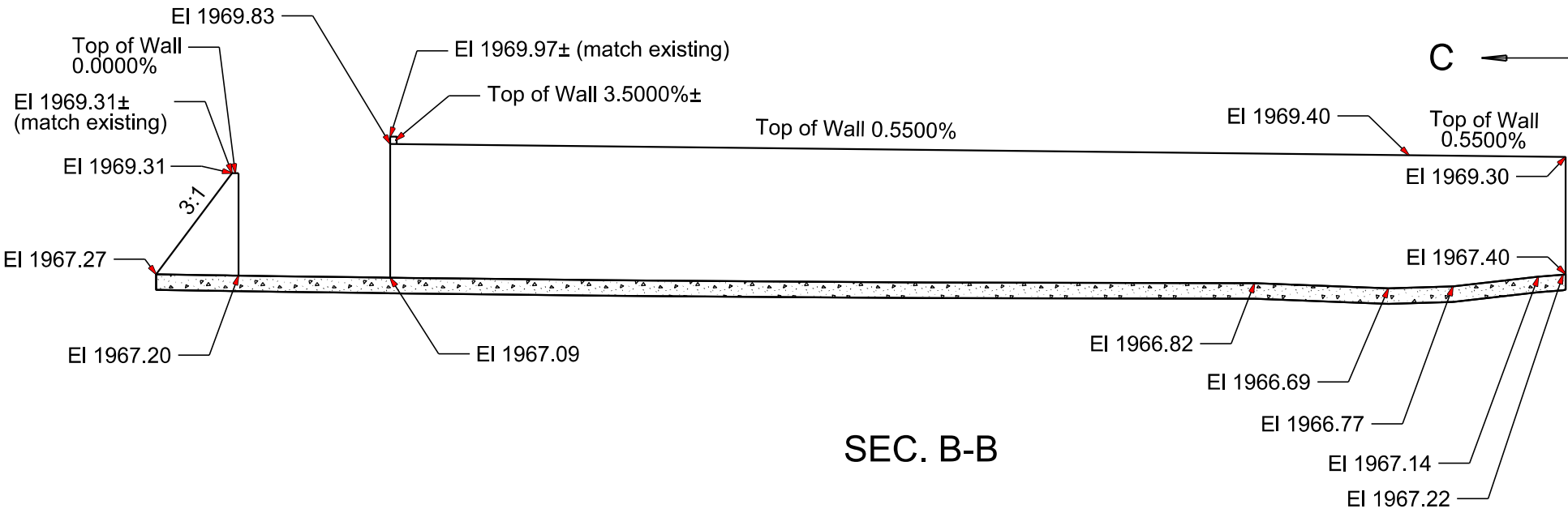
70+90.61-48.17' R to 71+99.41-78.00' R

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0018(191)250 P 0044(188)253		
Plotting Date: 06/03/2021		B151	B196

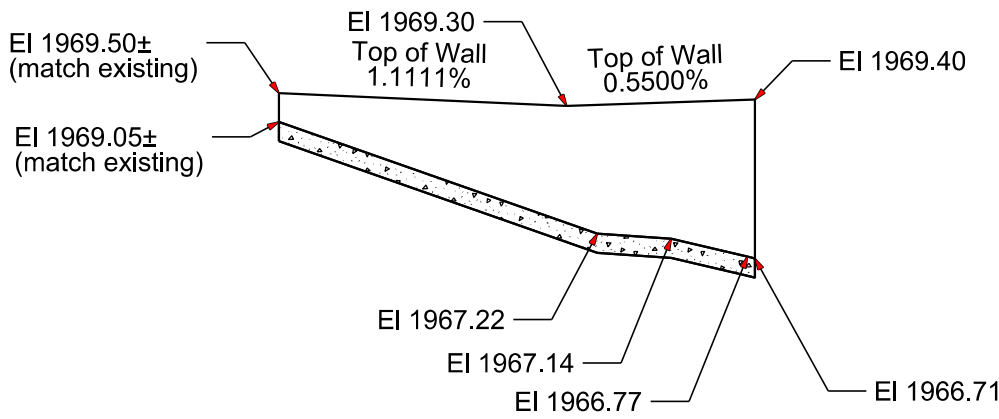
PLAN



SEC. A-A



SEC. B-B



SEC. C-C

Plot Scale - 1:40

Plotted From - TRPR14341

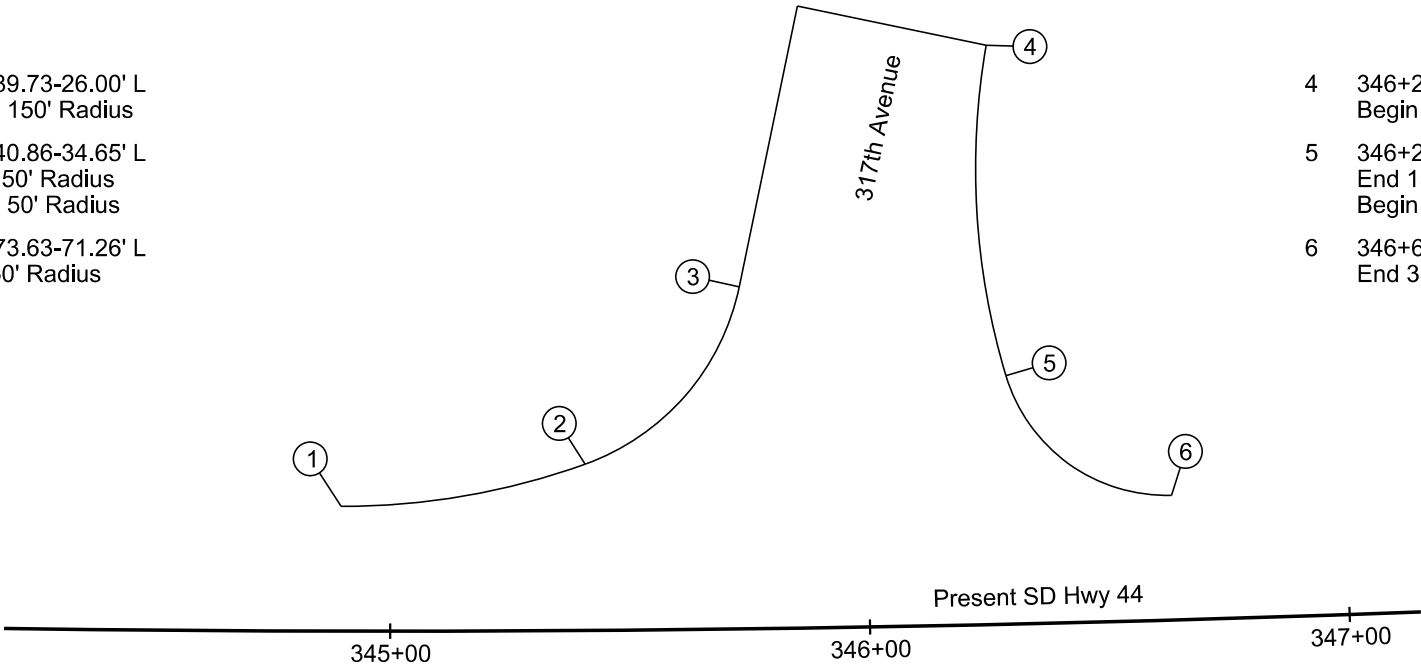
# INTERSECTION LAYOUT

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	NH 0018(191)250 P 0044(188)253		
Plotting Date: 02/24/2021		B152	B196



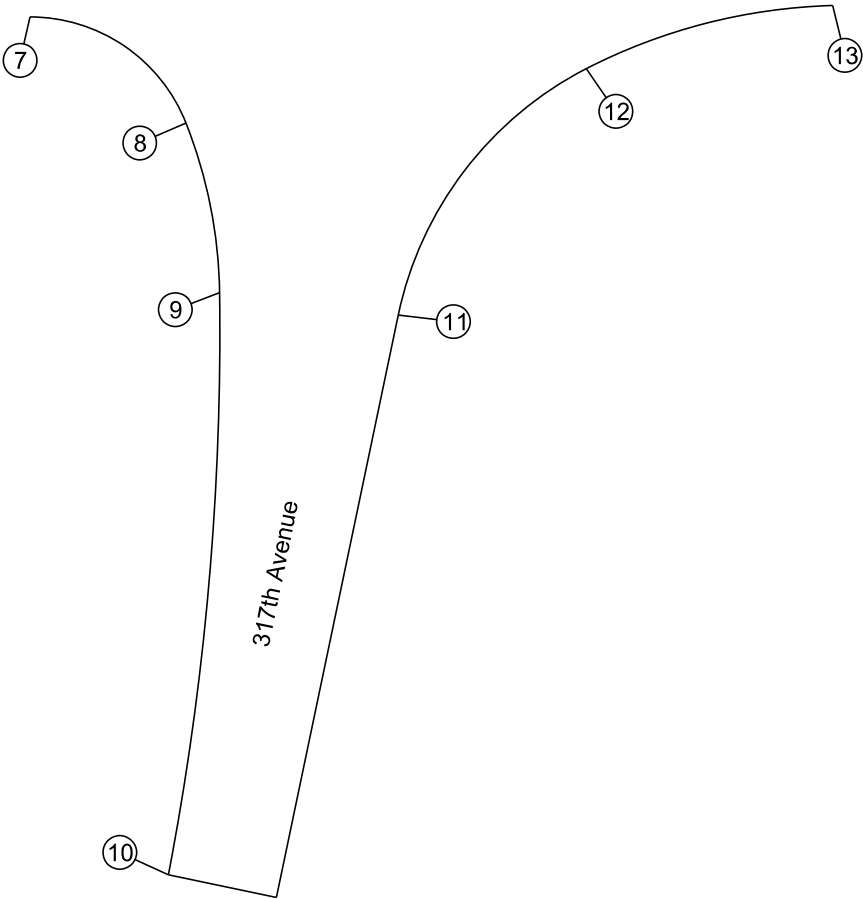
- 1 344+89.73-26.00' L  
Begin 150' Radius
- 2 345+40.86-34.65' L  
End 150' Radius  
Begin 50' Radius
- 3 345+73.63-71.26' L  
End 50' Radius

- 4 346+26.89-120.75' L  
Begin 150' Radius
- 5 346+29.49-51.80' L  
End 150' Radius  
Begin 35' Radius
- 6 346+63.59-26.00' L  
End 35' Radius



- 7 344+98.48-26.00' R  
Begin 35' Radius
- 8 345+30.76-48.23' R  
End 35' Radius  
Begin 100' Radius
- 9 345+37.45-83.60' R  
End 100' Radius  
Begin 600' Radius
- 10 345+26.37-204.85' R  
End 600' Radius

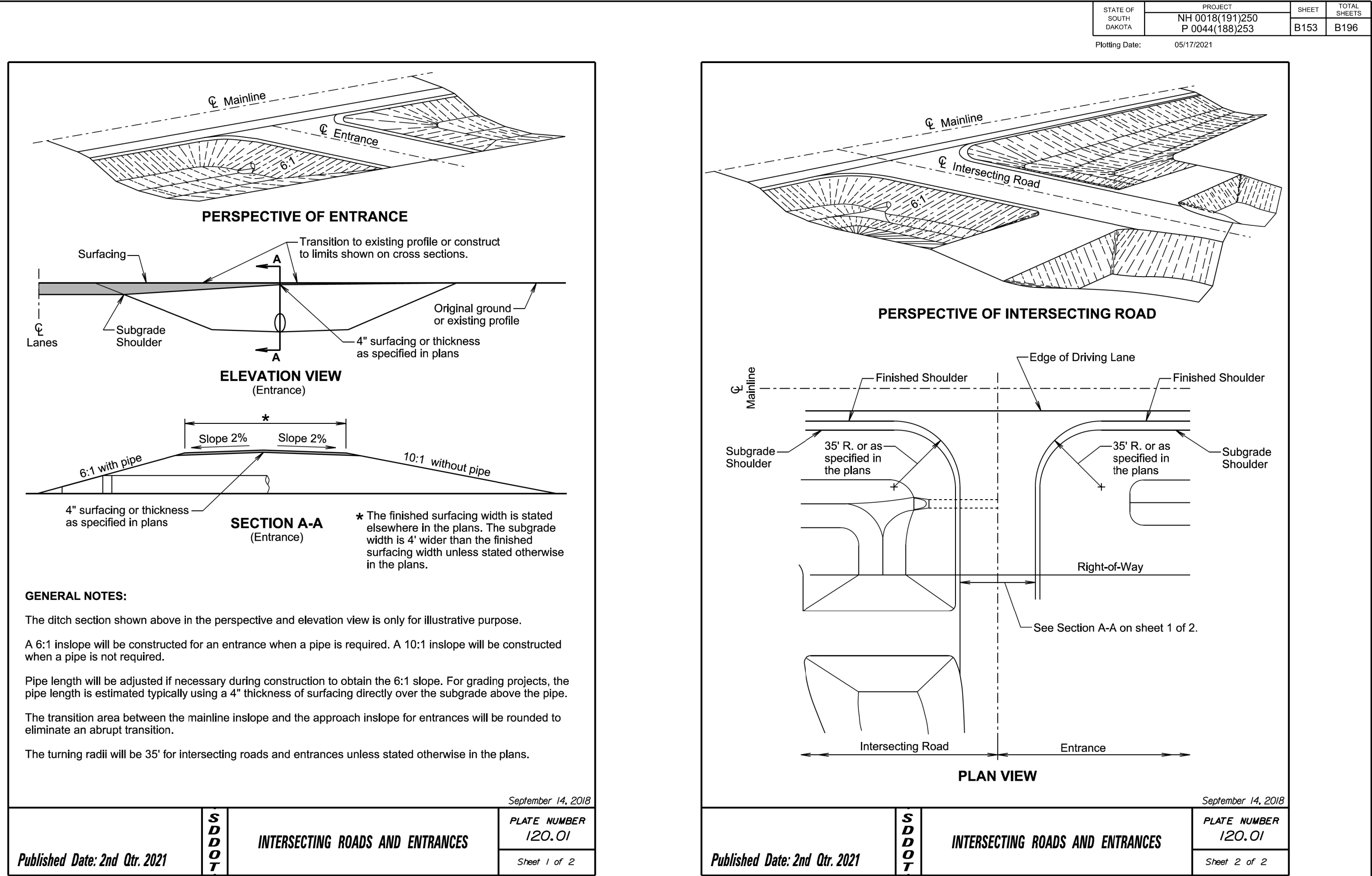
- 11 345+74.10-88.65' R  
Begin 75' Radius
- 12 346+13.66-37.94' R  
End 75' Radius  
Begin 120' Radius
- 13 346+65.04-26.00' R  
End 120' Radius



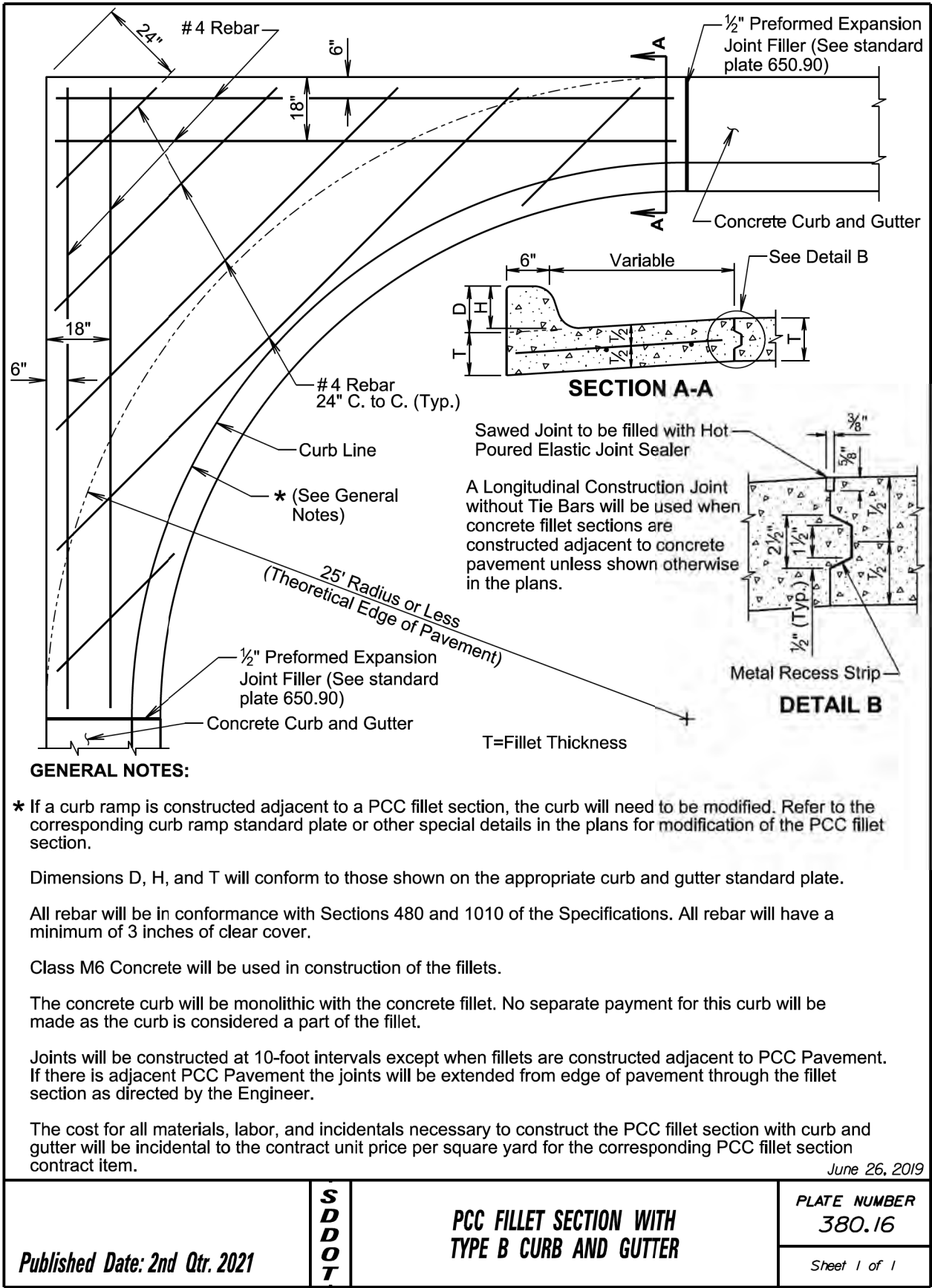
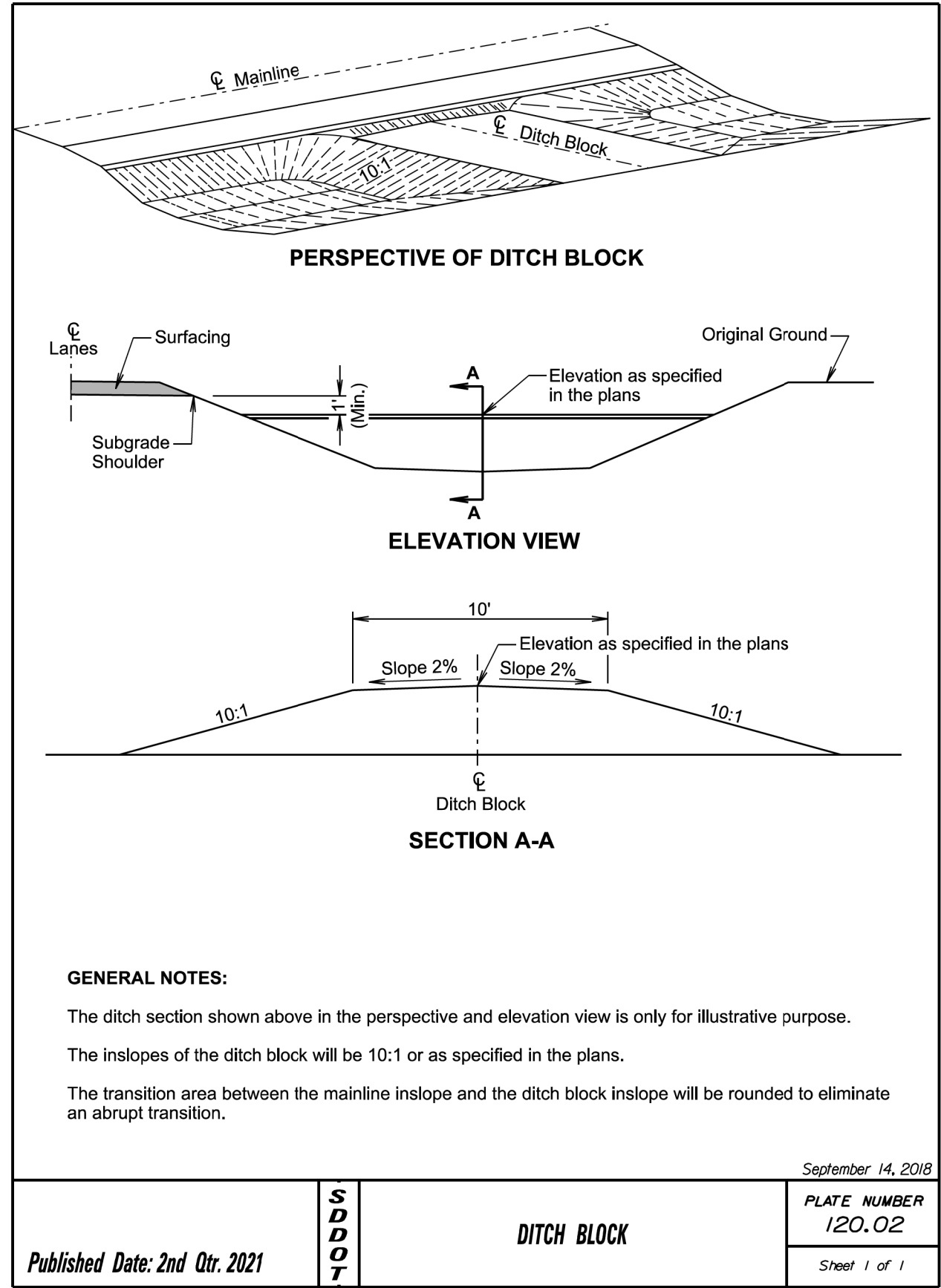
Edge of Proposed Finished Shoulder

Plot Scale - 1:200

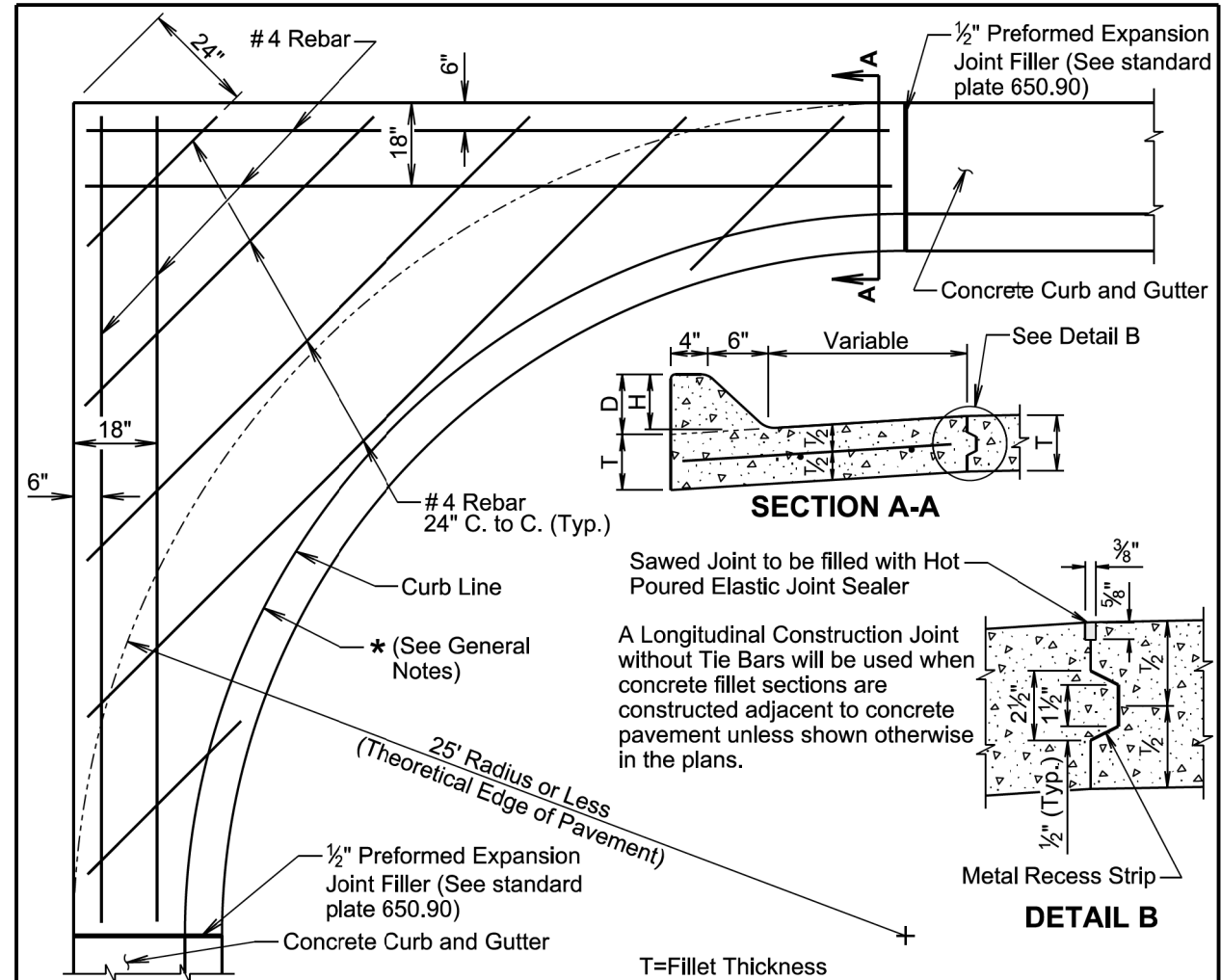
Plotted From - TRPR14341



File - ...trp031KStdPlateSectionB.dgn







**GENERAL NOTES:**

\* If a curb ramp is constructed adjacent to a PCC fillet section, the curb will need to be modified. Refer to the corresponding curb ramp standard plate or other special details in the plans for modification of the PCC fillet section.

Dimensions D, H, and T will conform to those shown on the appropriate curb and gutter standard plate.

All rebar will be in conformance with Sections 480 and 1010 of the Specifications. All rebar will have a minimum of 3 inches of clear cover.

Class M6 Concrete will be used in construction of the fillets.

The concrete curb will be monolithic with the concrete fillet. No separate payment for this curb will be made as the curb is considered a part of the fillet.

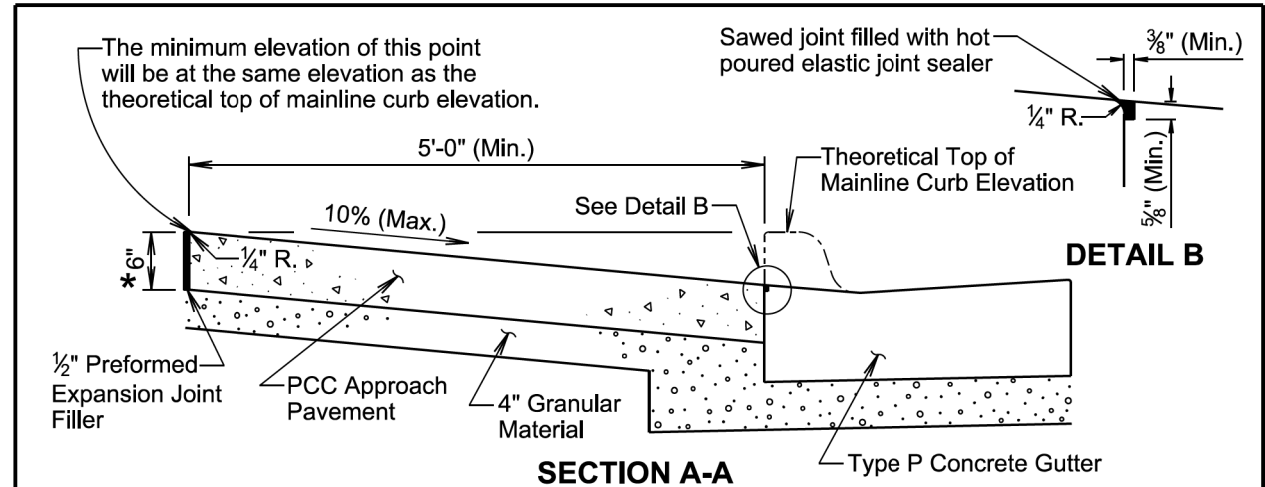
Joints will be constructed at 10-foot intervals except when fillets are constructed adjacent to PCC Pavement. If there is adjacent PCC Pavement the joints will be extended from edge of pavement through the fillet section as directed by the Engineer.

The cost for all materials, labor, and incidentals necessary to construct the PCC fillet section with curb and gutter will be incidental to the contract unit price per square yard for the corresponding PCC fillet section contract item.

June 26, 2019

<b>SDOT</b>	<b>PCC FILLET SECTION WITH TYPE F CURB AND GUTTER</b>	PLATE NUMBER 380.17
		Sheet 1 of 1

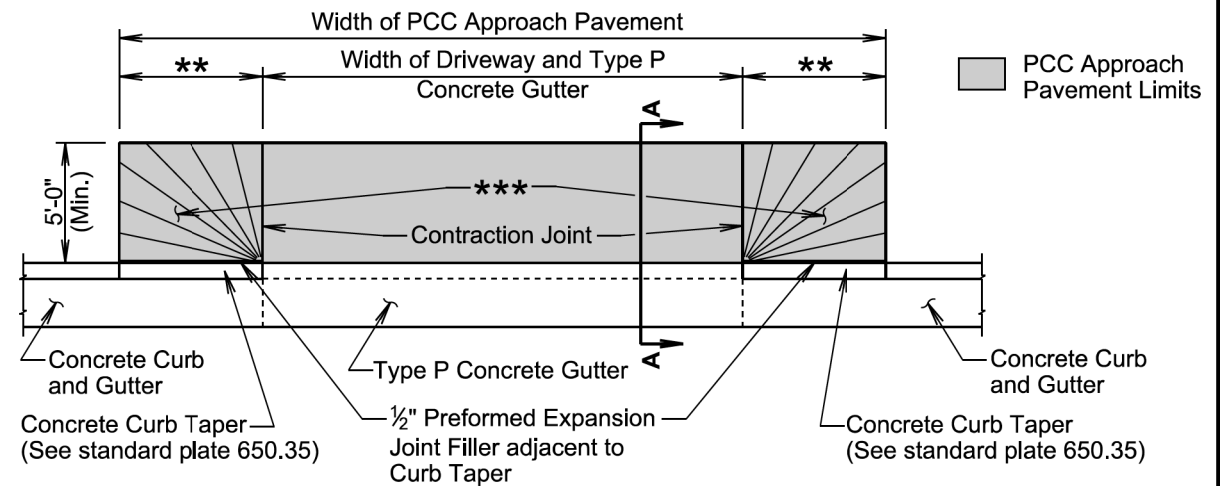
Published Date: 2nd Qtr. 2021



\* 8" at Commercial Approaches

\*\* Width for 6" high curb is 6' (See standard plate 650.35)

\*\*\* Within these areas, the surface of the type A PCC approach pavement will be sloped transitionally as approved by the Engineer.



**GENERAL NOTES:**

The concrete for the type A PCC approach pavement and adjacent driveway will comply with the requirements of the Specifications for class M6 concrete unless otherwise stated in the plans.

Contraction joints in the type A PCC approach pavement will be 1 1/2 inches deep if formed in the fresh concrete using a suitable grooving tool. If a saw is used to cut the contraction joints, then the depth of the joint will be at least 1/4 the thickness of the approach pavement. Additional contraction joints not shown in the Plan View will be spaced as follows:

One joint at the center of the approach for driveways 16 feet to 24 feet wide.

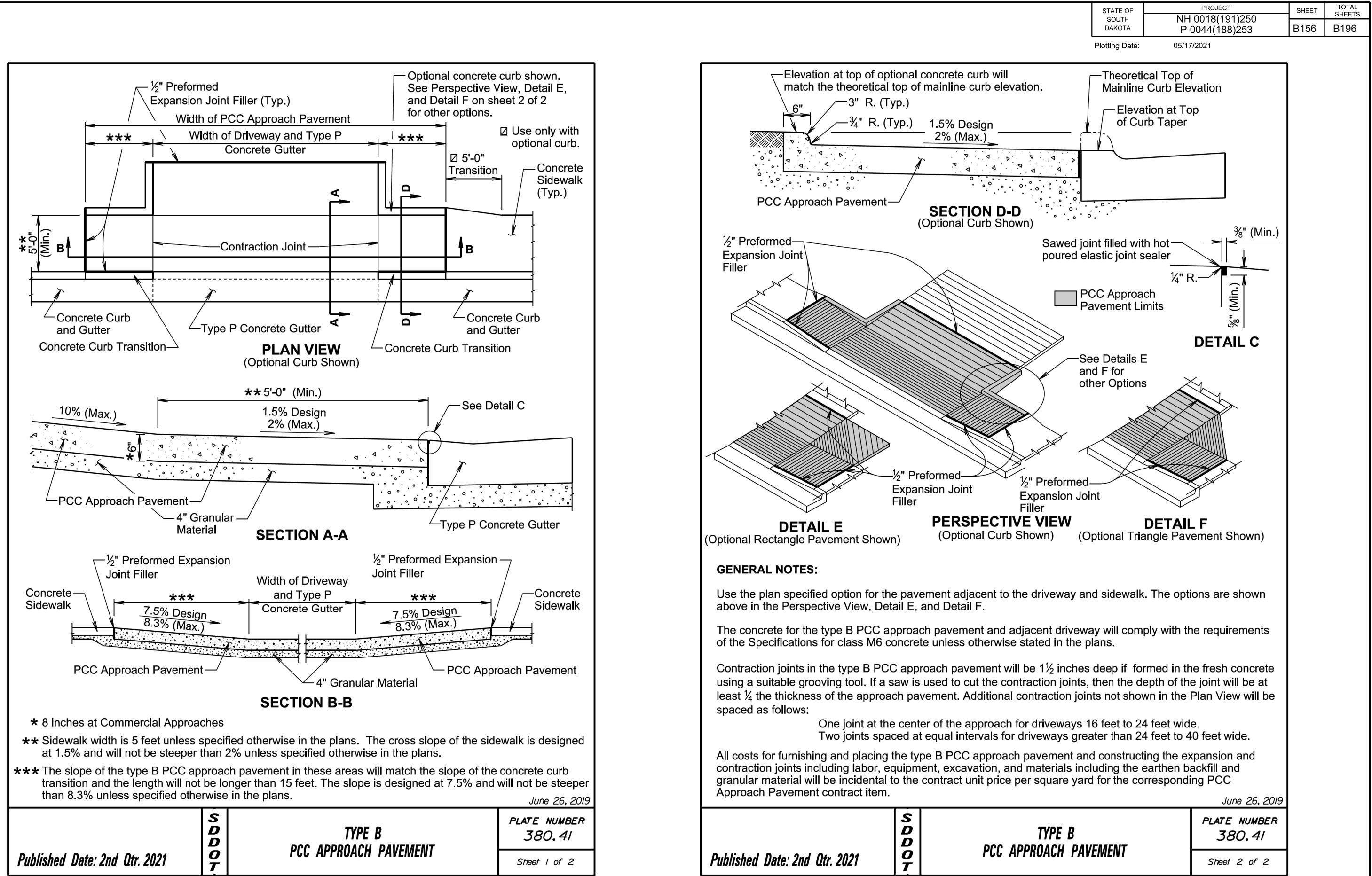
Two joints spaced at equal intervals for driveways greater than 24 feet to 40 feet wide.

All costs for furnishing and placing the type A PCC approach pavement and constructing the expansion and contraction joints including labor, equipment, excavation, and materials including the earthen backfill and granular material, will be incidental to the contract unit price per square yard for the corresponding PCC Approach Pavement contract item.

June 26, 2019

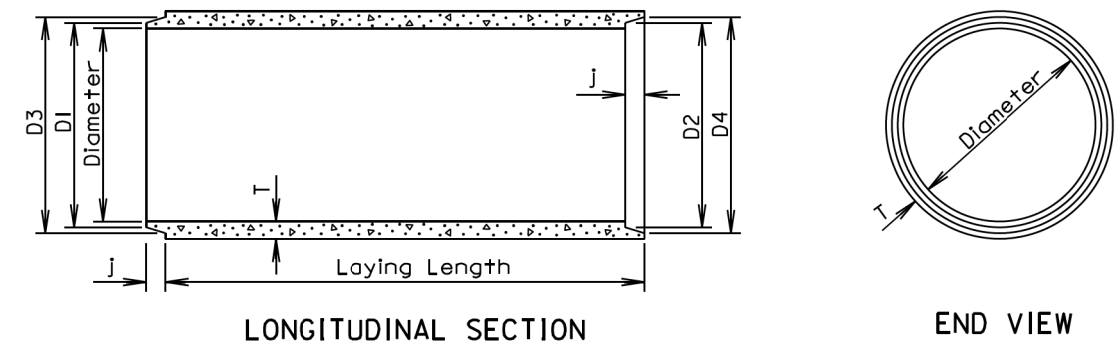
<b>SDOT</b>	<b>TYPE A PCC APPROACH PAVEMENT</b>	PLATE NUMBER 380.40
		Sheet 1 of 1

Published Date: 2nd Qtr. 2021



TOLERANCES IN DIMENSIONS

Diameter:  $\pm 1.5\%$  for 24" Dia. or less and  $\pm 1\%$  or  $\frac{3}{8}"$  whichever is more for 27" Dia. or greater.  
Diameters at joints:  $\pm \frac{3}{16}"$  for 30" Dia. or less and  $\pm \frac{1}{4}"$  for 36" or greater.  
Length of joint (J):  $\pm \frac{1}{4}"$ .  
Wall thickness (T): not less than design T by more than 5% or  $\frac{3}{16}"$ , whichever is greater.  
Laying length: shall not underrun by more than  $\frac{1}{2}"$ .



GENERAL NOTES:

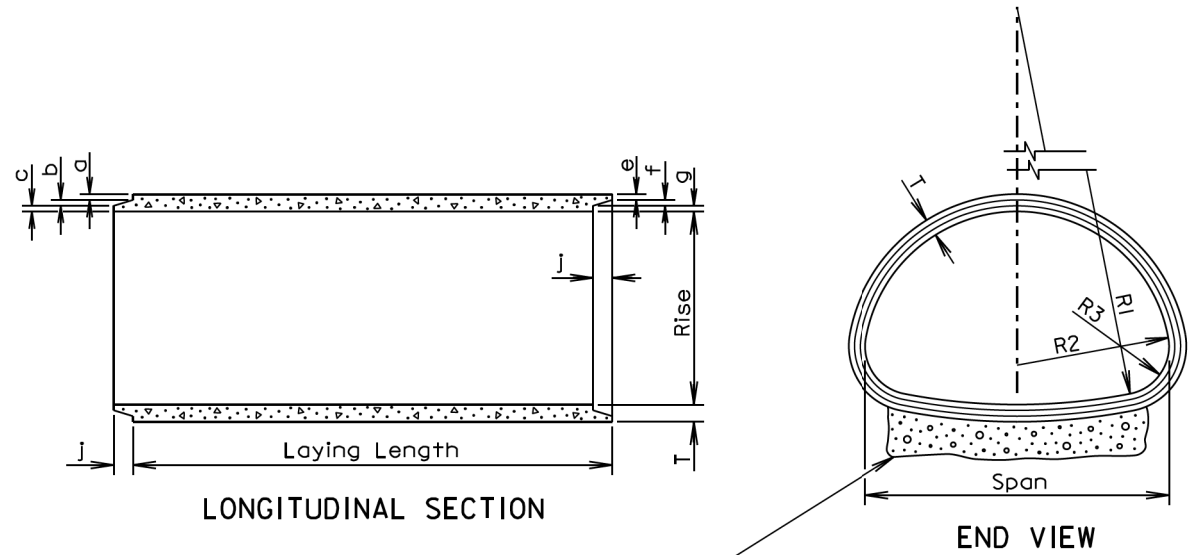
Construction of R.C.P. shall conform to the requirements of Section 990 of the Specifications.

Not more than 2 four-foot sections shall be permitted near the ends of any culvert. Four-foot lengths shall be used only to secure the required length of culvert.

Diam. (in.)	Approx. Wt./Ft. (lb.)	T (in.)	J (in.)	D1 (in.)	D2 (in.)	D3 (in.)	D4 (in.)
12	92	2	1 3/4	13 1/4	13 5/8	13 3/8	14 1/4
15	127	2 1/4	2	16 1/2	16 3/8	17 1/4	17 5/8
18	168	2 1/2	2 1/4	19 5/8	20	20 3/8	20 3/4
21	214	2 3/4	2 1/2	22 1/8	23 1/4	23 3/4	24 1/8
24	265	3	2 3/4	26	26 3/8	27	27 3/8
27	322	3 1/4	3	29 1/4	29 5/8	30 1/4	30 5/8
30	384	3 1/2	3 1/4	32 3/8	32 3/4	33 1/2	33 3/8
36	524	4	3 3/4	38 3/4	39 1/4	40	40 1/2
42	685	4 1/2	4	45 1/8	45 5/8	46 1/2	47
48	867	5	4 1/2	51 1/2	52	53	53 1/2
54	1070	5 1/2	4 1/2	57 1/8	58 3/8	59 3/8	59 7/8
60	1296	6	5	64 1/4	64 3/4	66	66 1/2
66	1542	6 1/2	5 1/2	70 5/8	71 1/8	72 1/2	73
72	1810	7	6	77	77 1/2	79	79 1/2
78	2098	7 1/2	6 1/2	83 3/8	83 3/8	85 5/8	86 1/8
84	2410	8	7	89 3/4	90 1/4	92 1/8	92 5/8
90	2740	8 1/2	7	95 3/4	96 1/4	98 1/8	98 5/8
96	2950	9	7	102 1/8	102 5/8	104 1/2	105
102	3075	9 1/2	7 1/2	109	109 1/2	111 1/2	112
108	3870	10	7 1/2	115 1/2	116	118	118 1/2

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		Sheet 1 of 1	



TOLERANCES IN DIMENSIONS

Radial dimensions at joints:  $\pm \frac{1}{8}"$  for 65" span or less and  $\pm \frac{1}{4}"$  for longer spans.  
Rise and Span:  $\pm 2\%$  of tabular values.  
Length of Joint (J):  $\pm \frac{1}{4}"$ .  
Wall thickness (T): not less than design T by more than 5% or  $\frac{3}{16}"$ , whichever is greater.  
Laying length: shall not underrun by more than  $\frac{1}{2}"$ .

Gravel Bedding Material shall be supplied for 102" to 169" spans. It shall be placed to a thickness of 6" (Min.) x 85% of the Span x Length of culvert and shall conform to the gradation requirements for gravel surfacing except material may be screened or may be plan provided material.

* Size (in.)	Approx. Wt./Ft. (lb.)	Rise (in.)	Span (in.)	T (in.)	a (in.)	b (in.)	c (in.)	J (in.)	e (in.)	f (in.)	g (in.)	R1 (in.)	R2 (in.)	R3 (in.)
18	170	13 1/2	22	2 1/2	1 3/8	3/8	3/4	2	1 1/8	3/8	1	27 1/2	13 3/4	5 1/4
24	320	18	28 1/2	3 1/2	1 5/8	1/2	1 3/8	3	1 3/8	1/2	1 5/8	40 1/16	14 3/4	4 5/8
30	450	22 1/2	36 1/4	4	1 13/16	5/8	1 9/16	3 1/2	1 9/16	5/8	1 13/16	51	18 3/4	6 1/8
36	600	26 5/8	43 3/4	4 1/2	2	3/4	1 3/4	4	1 3/4	3/4	2	62	22 1/2	6 1/2
42	740	31 5/16	51 1/8	4 1/2	2	3/4	1 3/4	4	1 3/4	3/4	2	73	26 1/4	7 3/4
48	890	36	58 1/2	5	2 1/4	3/4	2	5	2	3/4	2 1/4	84	30	8 7/8
54	1100	40	65	5 1/2	2 1/2	3/4	2 1/4	5	2 1/4	3/4	2 1/2	92 1/2	33 3/8	10
60	1400	45	73 1/2	6	3 5/16	3/4	1 5/16	5	2 3/4	3/4	2 1/2	105	37 1/2	11
72	1900	54	88	7	3 13/16	1	2 3/16	6	3 1/4	1	2 3/4	126	45	13 5/16
84	2500	62	102	8	4 1/8	1	2 7/8	6	3 1/2	1	3 1/2	162 1/2	52	14 1/2
96	3300	78	122 3/8	9	4 1/2	1	3 1/2	7	4	1	4	218	62	20
108	4200	88	138 1/2	10	5	1	4	7	4 1/2	1	4 1/2	269	70	22
120	5100	96 7/8	154	11	5 1/2	1	4 1/2	7	5	1	5	301 3/8	78	24
132	5100	106 1/2	168 3/4	10		1	4	7	4 1/2	1	4 1/2	329	85 5/8	26 1/8

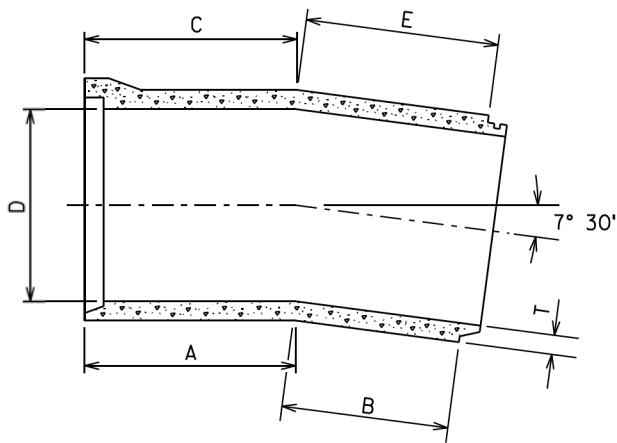
\* Equivalent Diameter of Circular R.C.P.

GENERAL NOTES:

Construction of R.C.P. Arch shall conform to the requirements of Section 990 of the Specifications. Not more than 2 four-foot sections shall be permitted near the ends of any culvert. Four-foot lengths shall be used only to secure the required length of culvert.

June 26, 2015

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		Sheet 1 of 1	

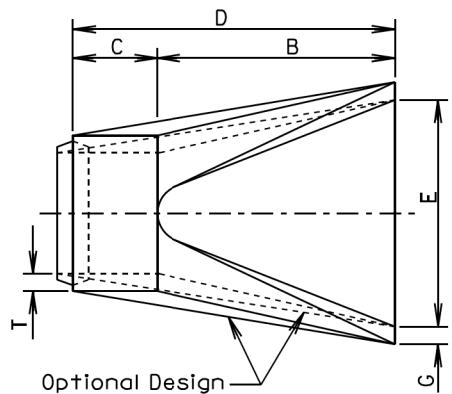


**GENERAL NOTE:**  
Centerline laying length: 4'-0  
Radius of Curve: 30.5'

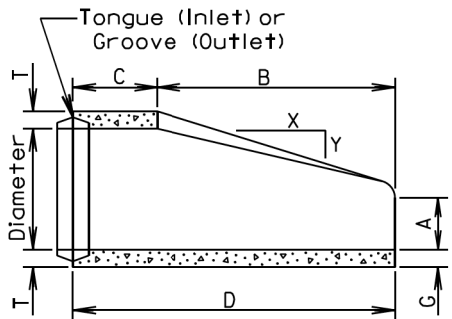
D (in.)	T (in.)	A (in.)	B (in.)	C (in.)	E (in.)	Weight of Section (lbs.)
12	2	36 <sup>15</sup> / <sub>32</sub>	10 <sup>15</sup> / <sub>32</sub>	37 <sup>17</sup> / <sub>32</sub>	11 <sup>17</sup> / <sub>32</sub>	368
15	2 <sup>1</sup> / <sub>4</sub>	36 <sup>1</sup> / <sub>2</sub>	10 <sup>1</sup> / <sub>4</sub>	37 <sup>3</sup> / <sub>4</sub>	11 <sup>1</sup> / <sub>2</sub>	508
18	2 <sup>1</sup> / <sub>2</sub>	24 <sup>1</sup> / <sub>2</sub>	22	26	23 <sup>1</sup> / <sub>2</sub>	672
21	2 <sup>3</sup> / <sub>4</sub>	24 <sup>1</sup> / <sub>2</sub>	21 <sup>3</sup> / <sub>4</sub>	26 <sup>1</sup> / <sub>4</sub>	23 <sup>1</sup> / <sub>2</sub>	856
24	3	25 <sup>1</sup> / <sub>32</sub>	21 <sup>1</sup> / <sub>32</sub>	26 <sup>3</sup> / <sub>32</sub>	22 <sup>3</sup> / <sub>32</sub>	1060
27	3 <sup>1</sup> / <sub>4</sub>	25 <sup>1</sup> / <sub>32</sub>	20 <sup>25</sup> / <sub>32</sub>	27 <sup>7</sup> / <sub>32</sub>	22 <sup>3</sup> / <sub>32</sub>	1288
30	3 <sup>1</sup> / <sub>2</sub>	25 <sup>1</sup> / <sub>32</sub>	20 <sup>17</sup> / <sub>32</sub>	27 <sup>15</sup> / <sub>32</sub>	22 <sup>3</sup> / <sub>32</sub>	1536
33	3 <sup>3</sup> / <sub>4</sub>	24 <sup>15</sup> / <sub>16</sub>	20 <sup>7</sup> / <sub>16</sub>	27 <sup>9</sup> / <sub>16</sub>	23 <sup>1</sup> / <sub>16</sub>	1808
36	4	24 <sup>13</sup> / <sub>16</sub>	20 <sup>5</sup> / <sub>16</sub>	27 <sup>11</sup> / <sub>16</sub>	23 <sup>3</sup> / <sub>16</sub>	2096
42	4 <sup>1</sup> / <sub>2</sub>	24 <sup>27</sup> / <sub>32</sub>	19 <sup>27</sup> / <sub>32</sub>	28 <sup>5</sup> / <sub>32</sub>	23 <sup>5</sup> / <sub>32</sub>	2740
48	5	24 <sup>19</sup> / <sub>32</sub>	19 <sup>19</sup> / <sub>32</sub>	28 <sup>13</sup> / <sub>32</sub>	23 <sup>13</sup> / <sub>32</sub>	3468
54	5 <sup>1</sup> / <sub>2</sub>	24 <sup>5</sup> / <sub>8</sub>	19 <sup>1</sup> / <sub>8</sub>	29 <sup>11</sup> / <sub>32</sub>	23 <sup>3</sup> / <sub>8</sub>	4280
60	6	24 <sup>3</sup> / <sub>32</sub>	18 <sup>3</sup> / <sub>32</sub>	29 <sup>11</sup> / <sub>32</sub>	23 <sup>11</sup> / <sub>32</sub>	5184
66	6 <sup>1</sup> / <sub>2</sub>	24 <sup>11</sup> / <sub>16</sub>	18 <sup>3</sup> / <sub>16</sub>	29 <sup>13</sup> / <sub>16</sub>	23 <sup>5</sup> / <sub>16</sub>	6168
72	7	24 <sup>1</sup> / <sub>8</sub>	18 <sup>1</sup> / <sub>8</sub>	29 <sup>7</sup> / <sub>8</sub>	23 <sup>7</sup> / <sub>8</sub>	7240
84	8	24 <sup>1</sup> / <sub>4</sub>	17 <sup>1</sup> / <sub>4</sub>	30 <sup>3</sup> / <sub>4</sub>	23 <sup>3</sup> / <sub>4</sub>	9640
96	9	23 <sup>5</sup> / <sub>16</sub>	17 <sup>5</sup> / <sub>16</sub>	30 <sup>11</sup> / <sub>16</sub>	24 <sup>11</sup> / <sub>16</sub>	12400

March 31, 2000

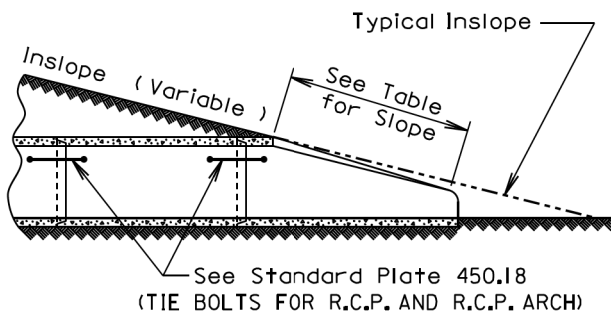
Published Date: 2nd Qtr. 2021	S D D O T	REINFORCED CONCRETE PIPE LONG RADIUS BEND	PLATE NUMBER 450.04
			Sheet 1 of 1



TOP VIEW

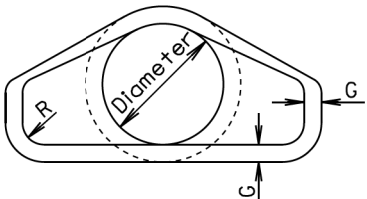


LONGITUDINAL SECTION



SLOPE DETAIL

**GENERAL NOTES:**  
Lengths of concrete pipe shown on plan sheets are between flared ends only.  
  
Construction of R.C.P. Flared End shall conform to the requirements of Section 990 of the Specifications.

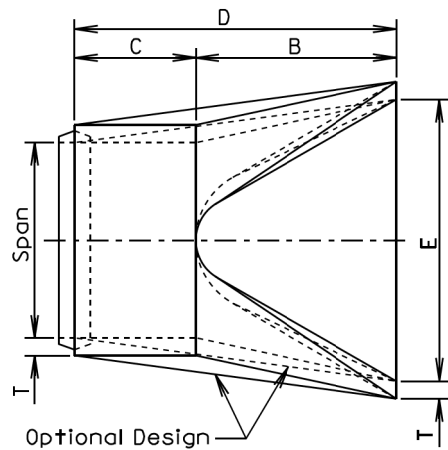


END VIEW

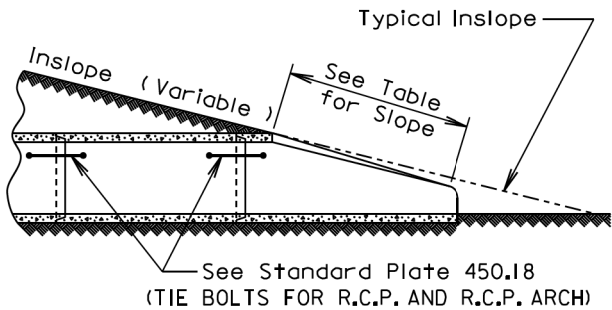
Dia. (in.)	Approx. Wt. of Section (lbs.)	Approx. Slope (X to Y)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	G (in.)	R (in.)
12	530	2.4: 1	2	4	24	48 <sup>7</sup> / <sub>8</sub>	72 <sup>7</sup> / <sub>8</sub>	24	2	1 <sup>1</sup> / <sub>2</sub>
15	740	2.4: 1	2 <sup>1</sup> / <sub>4</sub>	6	27	46	73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

June 26, 2015

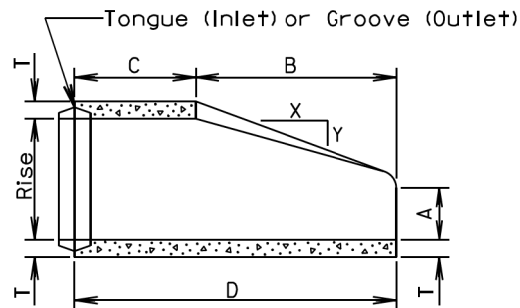
Published Date: 2nd Qtr. 2021	S D D O T	R. C. P. FLARED ENDS	PLATE NUMBER 450.10
			Sheet 1 of 1



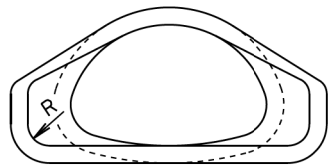
TOP VIEW



SLOPE DETAIL



LONGITUDINAL SECTION



END VIEW

GENERAL NOTES:

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

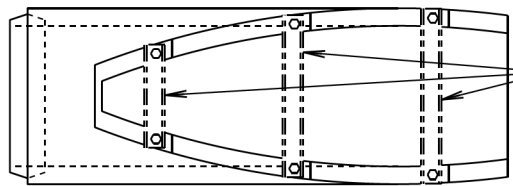
Construction of R.C.P. Arch Flared End shall conform to the requirements of Section 990 of the Specifications.

* Size (in.)	Approximate Weight of Section (lbs.)	Rise (in.)	Span (in.)	Slope (X:Y)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	R (in.)
18	1100	13 1/2	22	3:1	2 1/2	7	27	45	72	36	2
24	1750	18	28 1/2	3:1	3 1/2	8 1/2	39	33	72	48	3
30	3300	22 1/2	36 1/4	3:1	4	9 1/2	50	46	96	60	3
36	4350	26 5/8	43 3/4	3:1	4 1/2	11 1/8	60	36	96	72	6
42	5250	31 5/16	51 1/8	3:1	4 1/2	15 13/16	60	36	96	78	6
48	6400	36	58 1/2	3:1	5	21	60	36	96	84	6
54	7850	40	65	3:1	5 1/2	25 1/2	60	36	96	90	6
60	9500	45	73 1/2	3:1	6	31	60	36	96	96	6
72	13550	54	88	2:1	7	31	60	39	99	120	6
84	17950	62	102	2:1	8	28 1/2	83	19	102	144	6

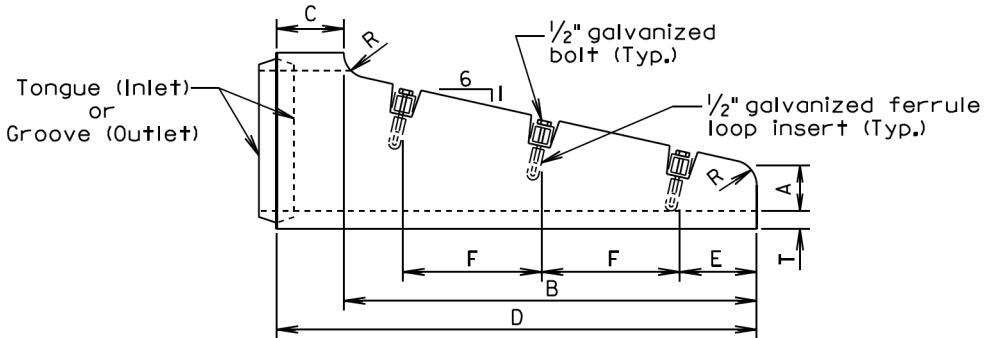
\*Equivalent Diameter of Circular R. C. P.

June 26, 2015

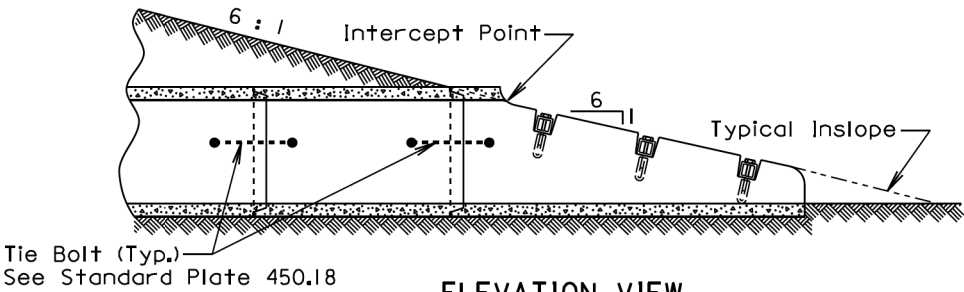
Published Date: 2nd Qtr. 2021	S D D O T	R. C. P. ARCH FLARED ENDS	PLATE NUMBER 450.11
			Sheet 1 of 1



TOP VIEW



SIDE VIEW



ELEVATION VIEW

Dia. (in.)	T (in.)	R (in.)	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	No. Sections	No. Bars
FOR CIRCULAR PIPE										
15	2 1/4	3	6	48	9	57	6	18	1	3
18	2 1/2	3	6	69	9	78	9	24	1	3
*24	3	3	6	111	9	120	6	24	1 or 2	5
FOR ARCH PIPE										
**18	2 1/2	1	6	39	33	72	6	24	1	2

\*The use of 2 sections must be an approved design.  
\*\*Equivalent Diameter of Circular R. C. P.

GENERAL NOTES:

The length of concrete pipe shown on the plans is between safety ends.

Safety ends without bars are acceptable with or without the bar notches.

Bars shall be galvanized after fabrication in accordance with ASTM A123.

August 31, 2013

Published Date: 2nd Qtr. 2021	S D D O T	R. C. P. SAFETY ENDS WITH OR WITHOUT BARS	PLATE NUMBER 450.12
			Sheet 1 of 1

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

\* Equivalent Diameter of Circular R.C.P.  
\*\* Acceptable Flat Bottom Alternate.

**GENERAL NOTE:**  
The length of concrete pipe shown in the construction plans is between sloped ends.

September 22, 2006

SD DOT	R. C. P. SLOPED ENDS	PLATE NUMBER 450.13
		Sheet 1 of 1
		Published Date: 2nd Qtr. 2021

Wall "t" (in.)	Rod Dia. (in.)	Pipe Sleeve Dia. (nominal)
≤ 3¼	5⁄8	¾
3½-6½	¾	1
≥ 7	1	1¼

**GENERAL NOTES:**  
Tie bolts shall conform to ASTM F1554 Grade 36 or ASTM A36. Nuts shall be heavy hex conforming to ASTM A563. Washers shall conform to ASTM F436.  
Pipe Sleeve shall conform to ASTM A500 or A53, Grade B.  
Galvanize adjustable eye bolt tie assembly in accordance with ASTM A153.

**ADJUSTABLE EYE BOLT TIE**

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

**GENERAL NOTES:**  
Angles shall conform to ASTM A36.  
Bolts shall conform to ASTM A307. Nuts shall be heavy hex conforming to ASTM A563. Washers shall conform to ASTM F436.  
Galvanize angles, bolts, nuts, and washers in accordance with ASTM A153.

**ANGLE AND BOLT TIE**

**GENERAL NOTES:**  
In lieu of the tie bolts detailed above other types of tie bolt connections may be installed as approved by the Office of Bridge Design.  
All pipe sections of R.C.P. and R.C.P. Arch shall be tied with tie bolts except for pipe located between drop inlets, manholes, and junction boxes. All pipe sections of pipes that only enter or exit drop inlets, manhole, and junction boxes shall be tied with tie bolts.  
There will be no separate measurement or payment for the tie bolts. The cost for furnishing and installing the tie bolts shall be incidental to the contract unit price per foot for the corresponding bid item for R.C.P. or R.C.P. Arch.

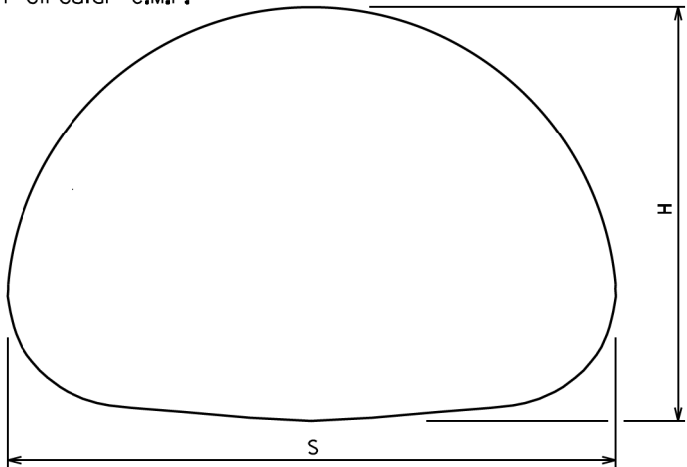
**END VIEW "CIRCULAR"**      **END VIEW "ARCH"**

February 28, 2013

SD DOT	TIE BOLTS FOR R.C.P. AND R.C.P. ARCH	PLATE NUMBER 450.18
		Sheet 1 of 1
		Published Date: 2nd Qtr. 2021

	2 <sup>2</sup> / <sub>3</sub> " x 1 <sup>1</sup> / <sub>2</sub> " CORRUGATIONS			3" X 1" CORRUGATIONS		
* Dia. (in.)	S Span (in.)	H Rise (in.)	Area (Sq. Ft.)	S Span (in.)	H Rise (in.)	Area (Sq. Ft.)
15	17	13	1.1			
18	21	15	1.6			
21	24	18	2.2			
24	28	20	2.8			
30	35	24	4.4			
36	42	29	6.4	40	31	7.0
42	49	33	8.7	46	36	9.4
48	57	38	11.4	53	41	12.3
54	64	43	14.3	60	46	15.6
60	71	47	17.6	66	51	19.3
66	77	52	21.3	73	55	23.2
72	83	57	25.3	81	59	27.4
78				87	63	32.1
84				95	67	37.0
90				103	71	42.4
96				112	75	48.0
102				117	79	54.2
108				128	83	60.8
114				137	87	67.4
120				142	91	74.5

\* Equivalent diameter of circular C.M.P.



GENERAL NOTE:  
All dimensions measured from inside crest.

March 31, 2000

Published Date: 2nd Qtr. 2021	S D D O T	CORRUGATED METAL PIPE ARCH CULVERT	PLATE NUMBER 450.30
			Sheet 1 of 1

2 Piece			2 Piece			3 Piece				
5° to 45° Elbow			50° to 90° Elbow			90° Elbow				
Diameter	A	L	Diameter	A	L	Diameter	A	B	C	L
Inches	Feet	Feet	Inches	Feet	Feet	Inches	Inches			Feet
12	1	2	12	2	4	12	25½	11	18½	4
15	1	2	15	2	4	15	26½	12	18	4
18	1	2	18	2	4	18	27	14	17	4
21	2	4	21	2	4	21	27	15	16½	4
24	2	4	24	2	4	24	27½	16	16	4
27	2	4	27	2	4	27	27½	17	15½	4
30	2	4	30	3	6	30	40	19	26½	6
33	2	4	33	3	6	33	40	20	26	6
36	2	4	36	3	6	36	40½	21	25½	6
42	2	4	42	3	6	42	41	23	24½	6
48	2	4	48	4	8	48	53½	26	35	8
54	3	6	54	4	8	54	54	28	34	8
60	3	6	60	4	8	60	54½	31	32½	8
66	3	6	66	4	8	66	54	33	31½	8
72	3	6	72	5	10	72	67½	36	42	10
78	3	6	78	5	10	78	68	39	40½	10
84	3	6	84	5	10	84	68½	41	39½	10
90	3	6	90	6	12	90	70	46	37	10
96	3	6	96	6	12	96	82	46	49	12

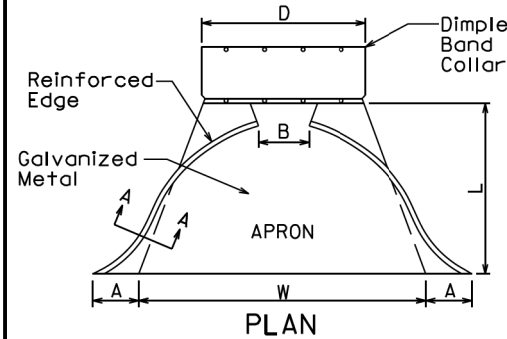
FABRICATED ELBOW LENGTHS FOR ALL CORRUGATIONS

GENERAL NOTES:  
All dimensions shown are nominal.  
L = Linear Feet of C.M.P. required to fabricate fitting.

June 26, 2001

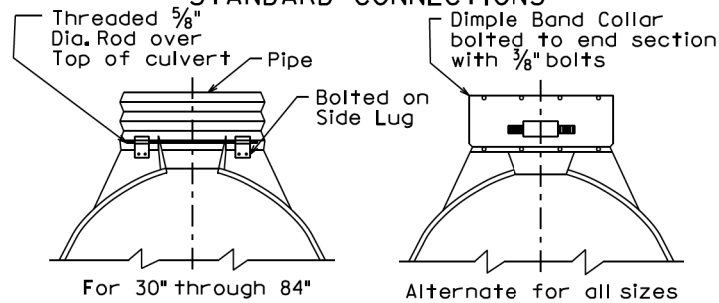
Published Date: 2nd Qtr. 2021	S D D O T	C.M.P. FABRICATED LENGTHS FOR ELBOWS	PLATE NUMBER 450.32
			Sheet 1 of 1

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



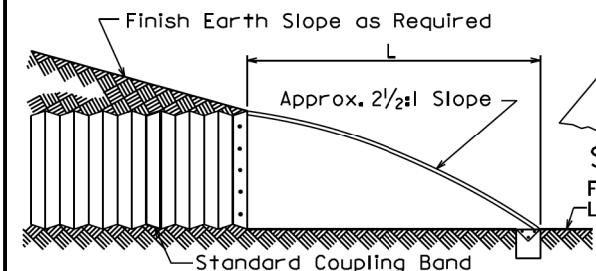
Dia. D (in.)	Ga.	DIMENSIONS (in.)						Approx. Slope	Body
		A	B	H	L	W			
12	16	6	6	6	21	24	2 1/2:1	1 Pc.	
15	16	7	8	6	26	30	2 1/2:1	1 Pc.	
18	16	8	10	6	31	36	2 1/2:1	1 Pc.	
21	16	9	12	6	36	42	2 1/2:1	1 Pc.	
24	16	10	13	6	41	48	2 1/2:1	1 Pc.	
30	14	12	16	8	46	60	2 1/2:1	1 Pc.	
36	14	14	19	9	51	72	2 1/2:1	2 Pc.	
42	12	16	22	11	60	84	2 1/2:1	2 Pc.	
48	12	18	27	12	69	90	2 1/4:1	2 Pc.	
54	12	18	30	12	78	102	2:1	3 Pc.	
60	12	18	33	12	84	114	1 3/4:1	3 Pc.	
66	12	18	36	12	87	120	1 1/2:1	3 Pc.	
72	12	18	39	12	87	126	1 1/3:1	3 Pc.	
78	12	18	42	12	87	132	1 1/4:1	3 Pc.	
84	12	18	45	12	87	138	1 1/6:1	3 Pc.	

STANDARD CONNECTIONS



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

TUBING ATTACHMENT DETAILS SECTION A-A



TYPICAL CROSS-SECTION

GENERAL NOTES:

All 3 pc. bodies shall have 12 Ga. sides and 10 Ga. center panels. Width of center panels shall be greater than 20% of the pipe periphery. Multiple panel bodies to have lap seams tightly joined by 3/8" Dia. galvanized rivets or bolts.

For 60" through 84" sizes, reinforced edges shall be supplemented with galvanized stiffener angles. The angles will be 2" x 2" x 1/4" for 60" through 72" diameters and 2 1/2" x 2 1/2" x 1/4" for 78" and 84" diameters. The angles shall be attached by 3/8" diameter galvanized nuts and bolts.

Rivets and Bolts shall be 3/8" Dia. Min. for 10 Ga. and 12 Ga. sheet, and 5/16" Dia. Min. for 14 Ga. and 16 Ga. sheets. Tighten nuts with torque wrench to 25 lbs. torque.

March 31, 2000

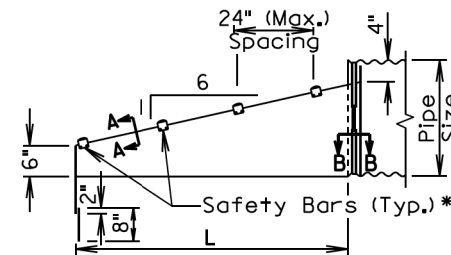
S  
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T

C.M.P. FLARED ENDS

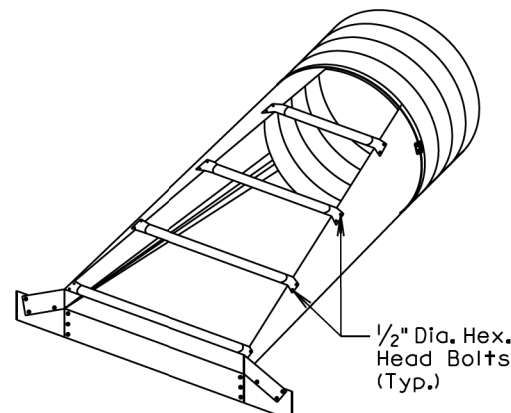
PLATE NUMBER  
450.35

Sheet 1 of 1

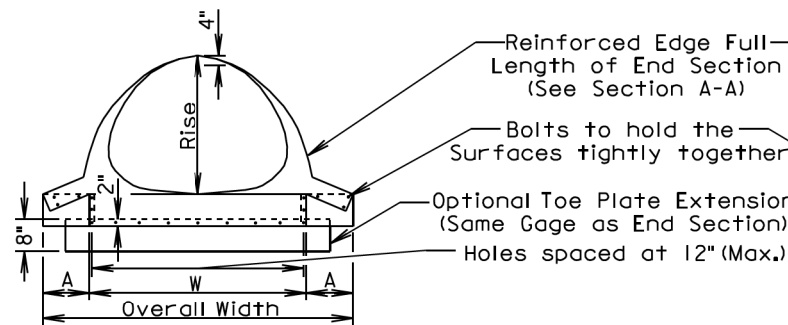
Published Date: 2nd Qtr. 2021



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

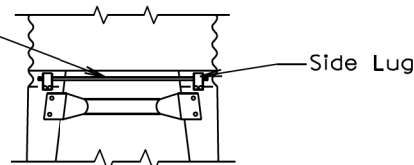


ISOMETRIC VIEW

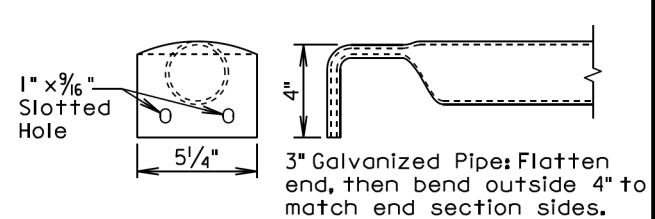


FRONT VIEW

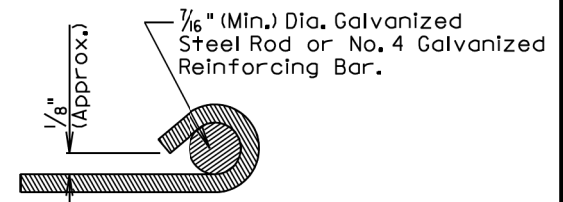
1/2" Threaded rod with flanged nuts. Form over top of end section. Side lugs to be bolted to end section



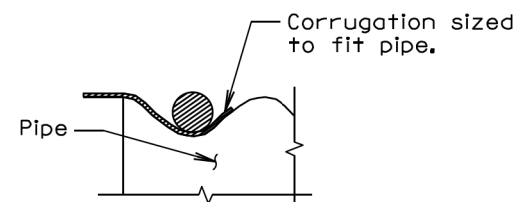
TYPE #2 CONNECTOR DETAIL  
(For 30" and Larger)  
(For 21" X 15" and Larger)



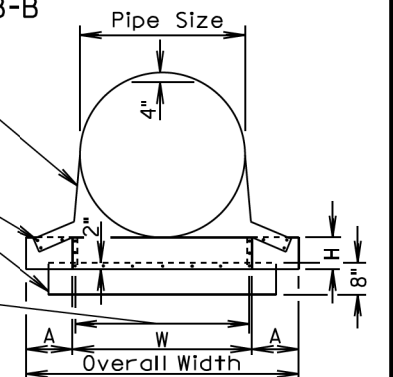
DETAIL OF SAFETY BARS



SECTION A-A

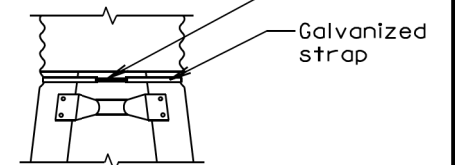


SECTION B-B



FRONT VIEW

1/2" x 6" Culvert bolt with flanged nut



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

June 26, 2015

S  
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T

C. M. P. SAFETY ENDS

PLATE NUMBER  
450.38

Sheet 1 of 2

Published Date: 2nd Qtr. 2021



ARCH C.M.P. SAFETY ENDS										
Equiv. 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 Specifications.

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

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

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

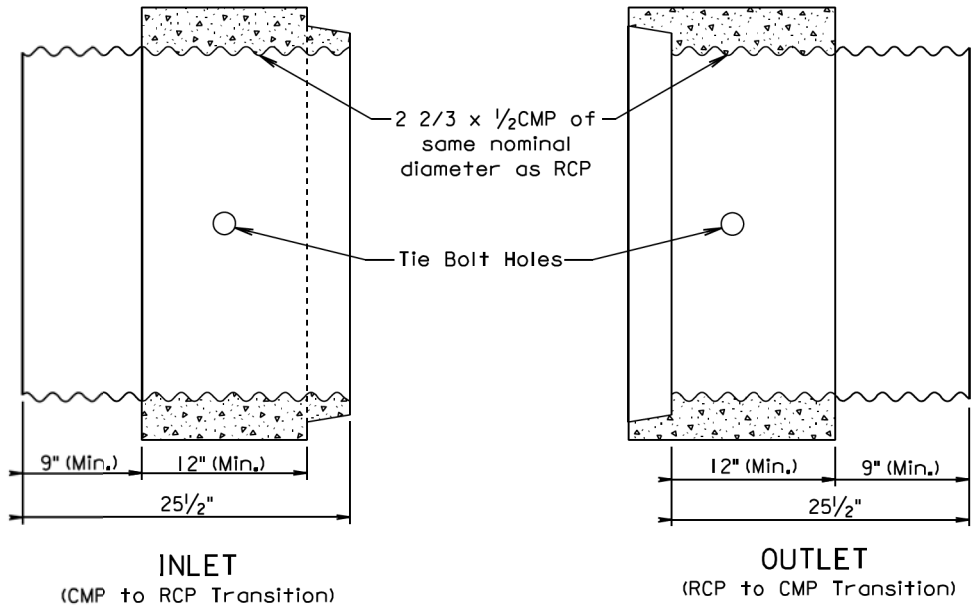
When stated in the plans, optional toe plate extension shall be punched and bolted to end section apron lip with 3/8" diameter galvanized bolts. Steel for toe plate extension shall be same gauge as end section. Dimensions shall be overall width less 6" by 8" high.

Installation shall be performed in accordance with the Specifications.

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

June 26, 2015

<i>Published Date: 2nd Qtr. 2021</i>	<b>S D D O T</b>	<b>C. M. P. SAFETY ENDS</b>	PLATE NUMBER 450.38
			Sheet 2 of 2



GENERAL NOTE:

Arch pipe transitions shall be fabricated similar to the round transition shown above.

March 31, 2000

<i>Published Date: 2nd Qtr. 2021</i>	<b>S D D O T</b>	<b>C.M.P. TO R.C.P. TRANSITION AND R.C.P. TO C.M.P. TRANSITION</b>	PLATE NUMBER 450.50
			Sheet 1 of 1

GENERAL NOTES:

- All concrete shall be Class M6 in accordance with Section 462.
- All reinforcing steel shall be epoxy coated and shall conform to ASTM A615, Grade 60. Epoxy coating shall conform to ASTM A775.
- Use 2 inch clear cover on all reinforcing steel except as shown.
- All concrete shall be thoroughly tamped and spaded against forms to leave a smooth surface without honeycomb. Finish of step treads to be steel troweled and then brush finished with brush strokes on treads at right angles to width. All exposed edges shall be chamfered 3/4 inch except as shown.
- Place concrete on undisturbed soil. If backfilling is necessary, compact with mechanical tampers to the satisfaction of the Engineer.
- The concrete sidewalk shall be constructed in accordance with Section 651.
- Cost of the double thickness of 1/2 inch Preformed Expansion Joint Filler shall be incidental to the contract unit price per cubic yard for "Class M6 Concrete".

SPECIAL NOTE:

Details for construction of the concrete stairway and handrails shown on sheet 2 of 2 are typical only, and are not intended to depict specific installations. Adjust the length of the stairway as required to fit specific site requirements. Use the formulas given on this sheet to adjust the unit price bid quantities to the required length of the stairway. Refer to project plans for requirements of individual locations. Alternate design details may be submitted through proper channels to the Office of Bridge Design for approval, including aluminum handrail installation.

REINFORCING SCHEDULE					Bending Details	
Mk.	ΔNo.	Size	Δ Length	Type		
b1	★	4	2h + 5	Str.		
b2	6	4	h + 1.67	17A		
b3	◇	4	h + 4.67	17A		
e	7	4	5' - 8"	S12		
g1	7	4	1.12w + 2.0	19B		
g2	2	4	1.12w + 3.7	19B		
p	2w + 7	4	6' - 2"	Str.		

★ 2 bars for h = 0 - 2.0'

3 bars for h = 2.1' - 3.5'

4 bars for h = 3.6' - 5.0'

◇ 2.67h - 3.33

Cut Required b1

Cut Required b3

Type 19B

Type 17A

Type S12

ESTIMATED QUANTITIES		
ITEM	UNIT	Δ QUANTITY
Class M6 Concrete	Cu. Yd.	0.87 + 0.23w + 0.04h <sup>2</sup>
Structure Excavation, Miscellaneous	Cu. Yd.	1.79 + 0.59w + 0.15h <sup>2</sup>
Epoxy Coated Reinforcing Steel	Lb.	◇
Pipe Handrail	Ft.	6.22 + 2.24w
Sidewalk	Sq. Ft.	33

◇ 72.62 + 14.97w + 1.78h<sup>2</sup> + 12.78h for h = 0 - 2.0'

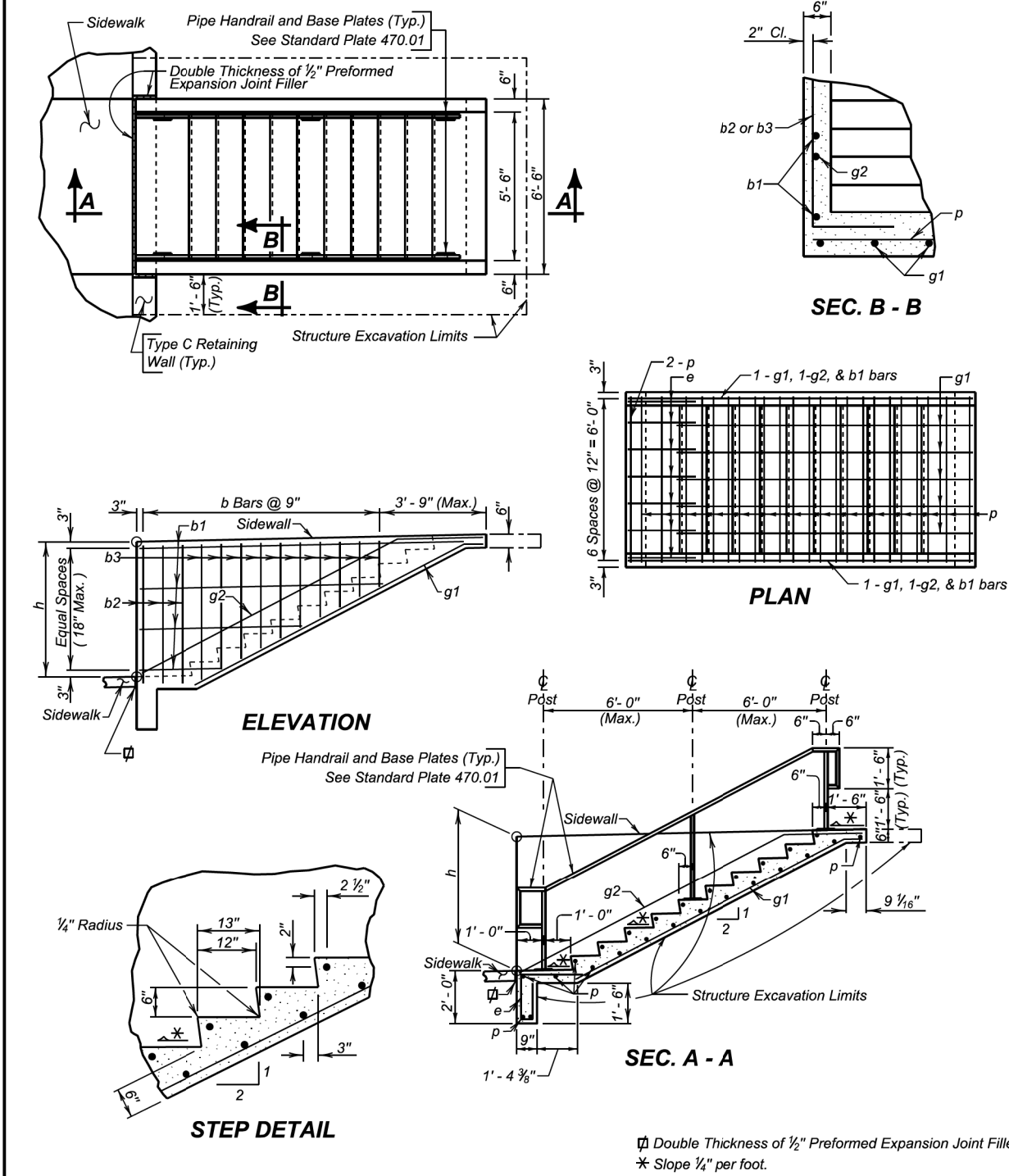
75.96 + 14.97w + 1.78h<sup>2</sup> + 14.12h for h = 2.1' - 3.5'

79.30 + 14.97w + 1.78h<sup>2</sup> + 15.46h for h = 3.6' - 5.0'

Δ w = Number of steps NOT including landings (i. e. w = 9 in Sec. A - A).

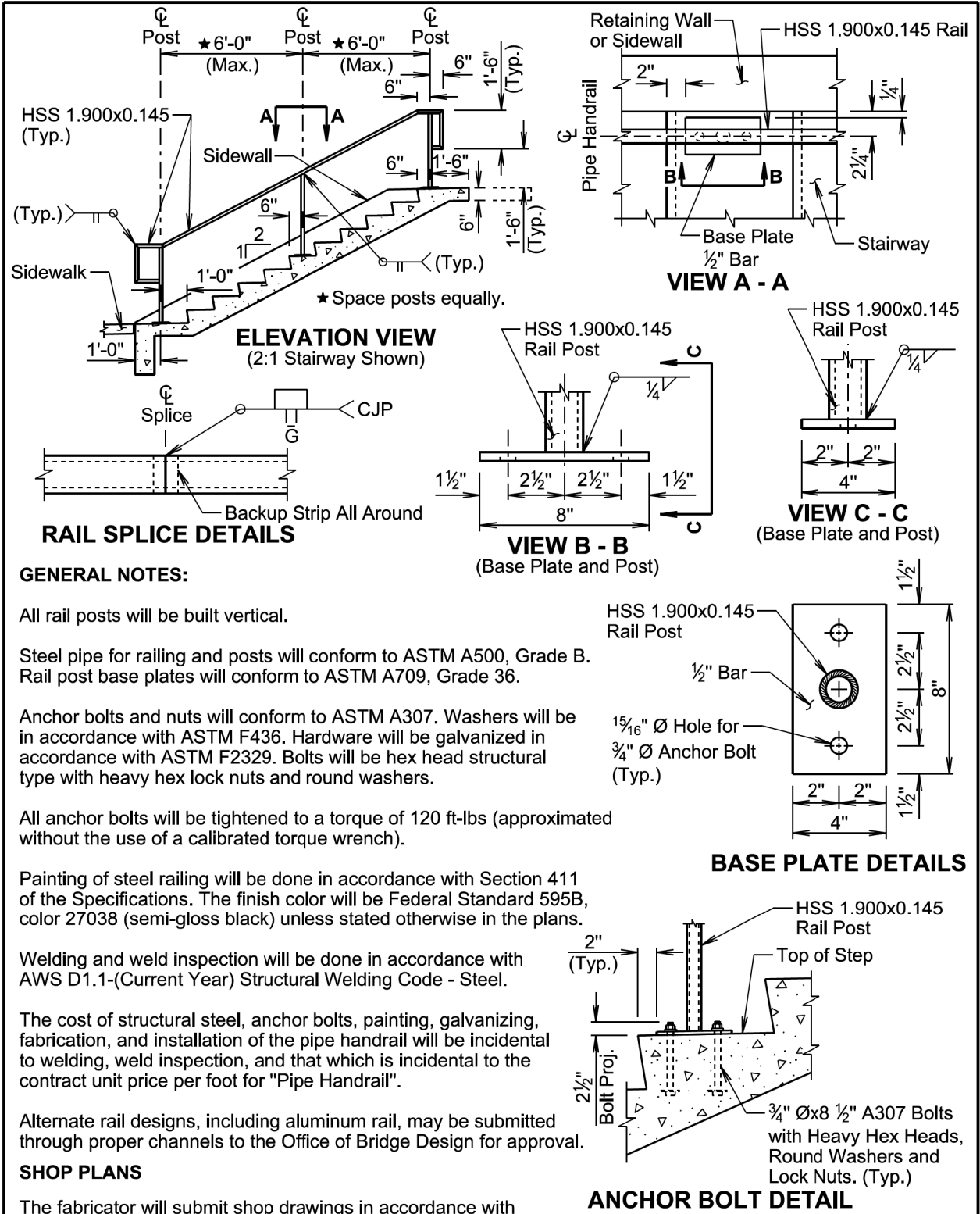
August 8, 2014

Published Date: 2nd Qtr. 2021	S D D O T	CONCRETE STAIRWAY FOR TYPE C CONCRETE RETAINING WALL	PLATE NUMBER 460.20
			Sheet 1 of 2



August 8, 2014

Published Date: 2nd Qtr. 2021	S D D O T	CONCRETE STAIRWAY FOR TYPE C CONCRETE RETAINING WALL	PLATE NUMBER 460.20
			Sheet 2 of 2



**GENERAL NOTES:**

All rail posts will be built vertical.

Steel pipe for railing and posts will conform to ASTM A500, Grade B. Rail post base plates will conform to ASTM A709, Grade 36.

Anchor bolts and nuts will conform to ASTM A307. Washers will be in accordance with ASTM F436. Hardware will be galvanized in accordance with ASTM F2329. Bolts will be hex head structural type with heavy hex lock nuts and round washers.

All anchor bolts will be tightened to a torque of 120 ft-lbs (approximated without the use of a calibrated torque wrench).

Painting of steel railing will be done in accordance with Section 411 of the Specifications. The finish color will be Federal Standard 595B, color 27038 (semi-gloss black) unless stated otherwise in the plans.

Welding and weld inspection will be done in accordance with AWS D1.1-(Current Year) Structural Welding Code - Steel.

The cost of structural steel, anchor bolts, painting, galvanizing, fabrication, and installation of the pipe handrail will be incidental to welding, weld inspection, and that which is incidental to the contract unit price per foot for "Pipe Handrail".

Alternate rail designs, including aluminum rail, may be submitted through proper channels to the Office of Bridge Design for approval.

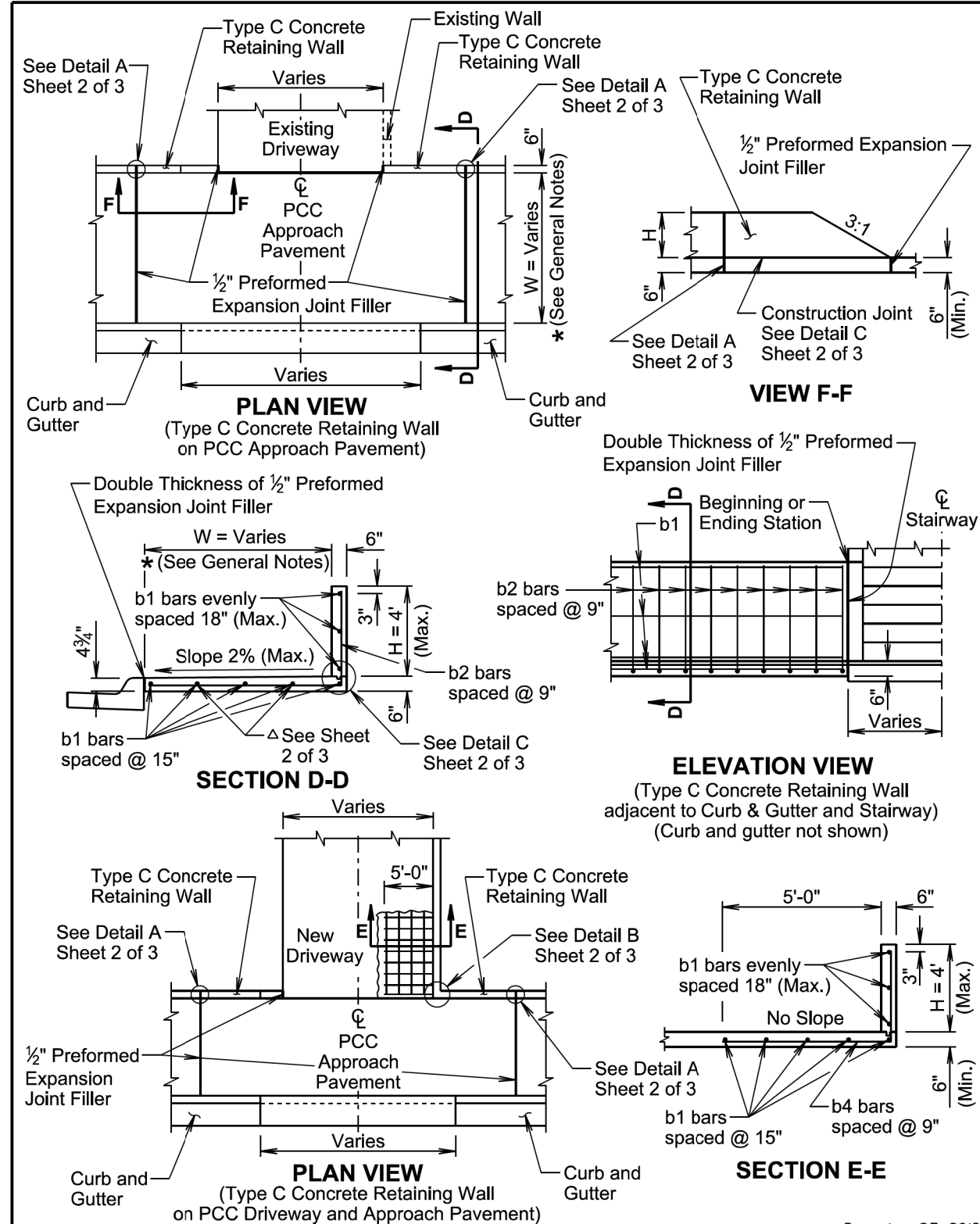
**SHOP PLANS**

The fabricator will submit shop drawings in accordance with the Specifications.

February 14, 2020

S D D O T	STAIRWAY HANDRAIL	PLATE NUMBER
		470.01
		Sheet 1 of 1

Published Date: 2nd Qtr. 2021



December 23, 2019

S D D O T	TYPE C CONCRETE RETAINING WALL	PLATE NUMBER
		530.01
		Sheet 1 of 3

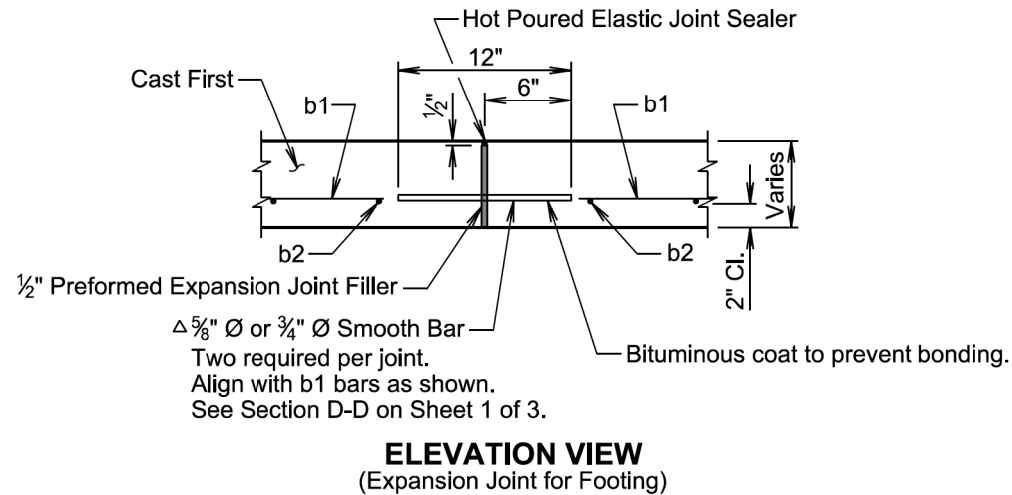
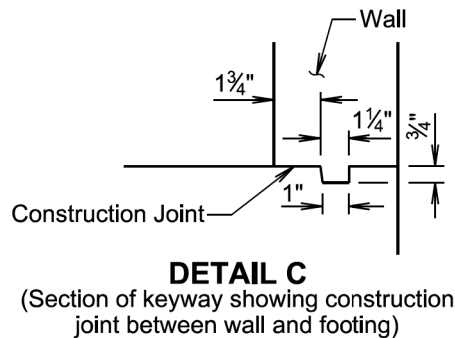
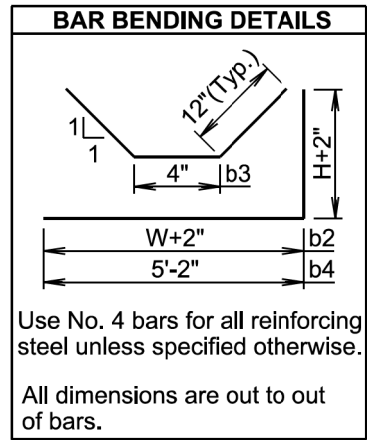
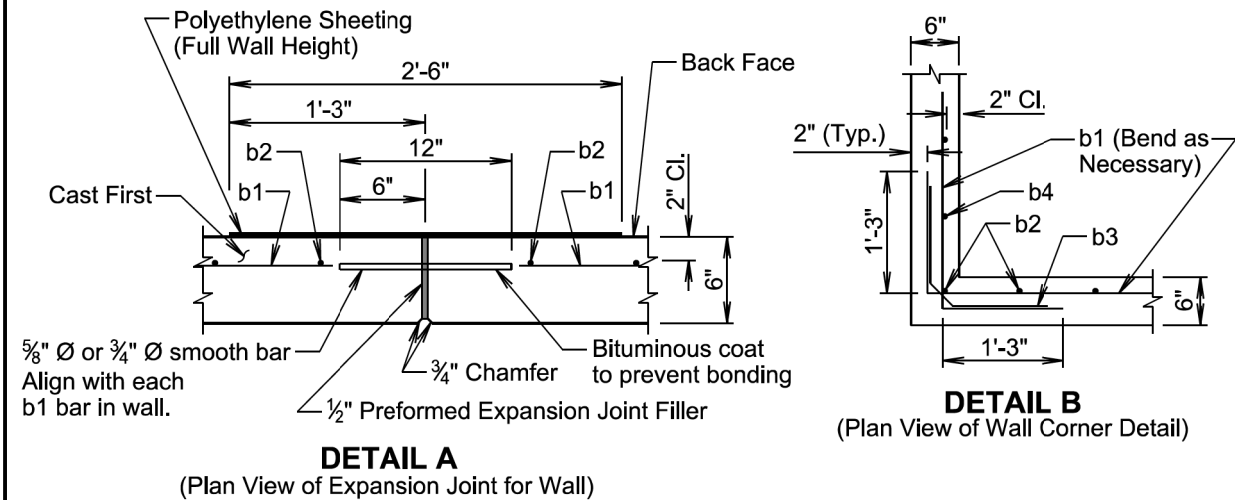
Published Date: 2nd Qtr. 2021

Plot Scale - 1:200

Plotted From - TRPR14341

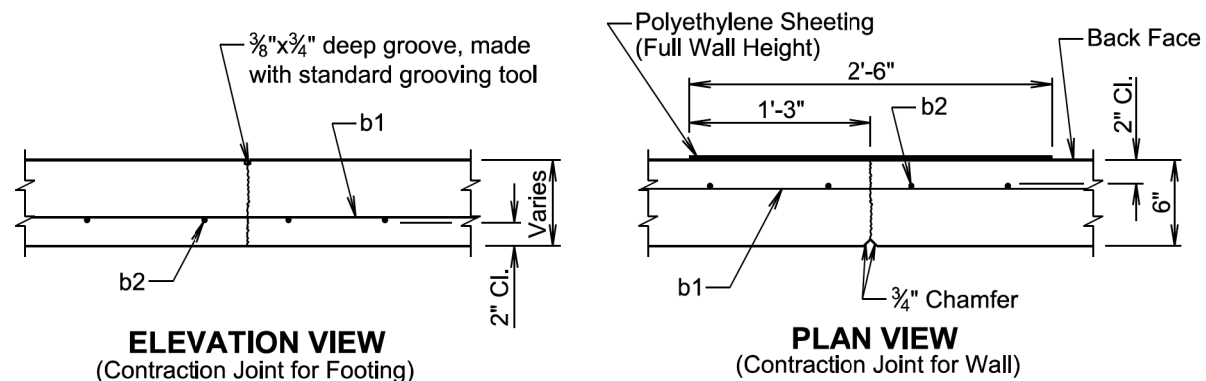
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0018(191)250 P 0044(188)253	B166	B196

Plotting Date: 05/17/2021



December 23, 2019

<i>Published Date: 2nd Qtr. 2021</i>	<b>S D D O T</b>	<b>TYPE C CONCRETE RETAINING WALL</b>	PLATE NUMBER 530.01
			Sheet 2 of 3



**GENERAL NOTES:**

The type C concrete retaining wall will be placed adjacent to pavement or curb and gutter as shown in section D-D on sheet 1 of 3.

- ★ The sidewalk width of the type C concrete retaining wall will not be wider than 8 feet or narrower than 5 feet. See plans for specified width.

In the areas where the retaining wall footing is to be placed, a 2-inch thickness of cushion material will be placed and compacted. The cushion material will conform to Section 651.2 C of the Specifications.

All concrete will be Class M6 and conform to Section 462 of the Specifications.

All reinforcing steel will be epoxy coated and will conform to ASTM A615, Grade 60. The smooth bar may conform to ASTM A615, Grade 40. The epoxy coating will conform to ASTM A775.

For variable height walls, the top b1 bar will be placed parallel to the top of the wall.

The b1 bars will be lapped a minimum of 12 inches.

A 3/4 inch chamfer will be provided on all exposed retaining wall edges.

Use Detail B on sheet 2 of 3 for constructing corners in the retaining wall.

The maximum expansion joint spacing will be 90 feet and the maximum contraction joint spacing will be 30 feet. The contraction and expansion joints will be placed to match pavement or curb joints where possible.

The exposed retaining wall surfaces will receive a finish in accordance with 460.3 L of the Specifications. The exposed surface of the retaining wall footing, when used as a sidewalk, will receive a broom finish.

The type C concrete retaining wall will be measured to the nearest square foot of front face area of the wall. The front face area of the footing is excluded from the measurement.

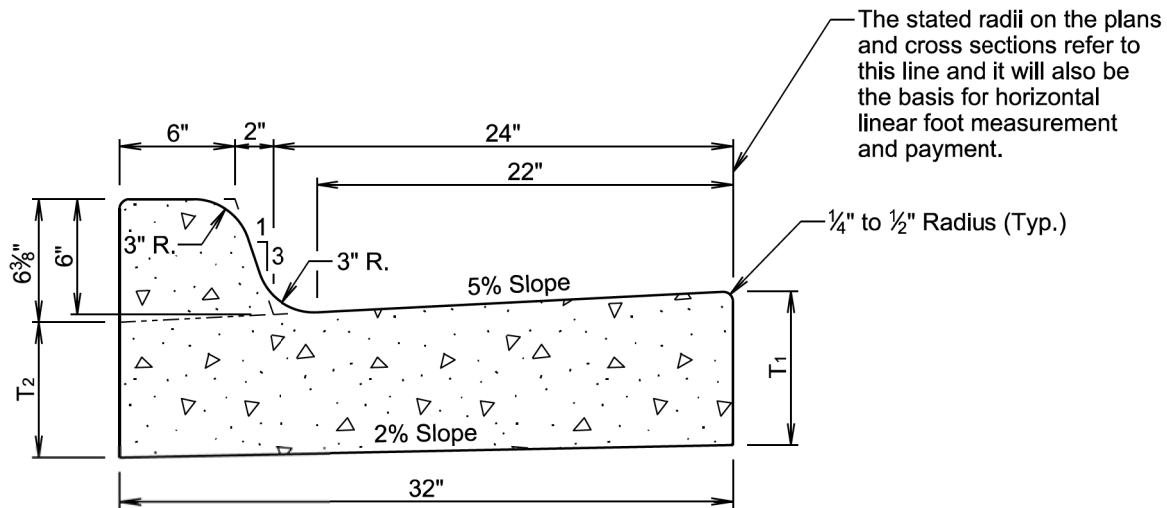
All costs for excavation, furnishing and placing backfill and cushion material, labor, equipment, preformed expansion joint filler, all reinforcing steel including the smooth bars, and all concrete except in the areas of PCC driveway and approach pavement, will be incidental to the contract unit price per square foot for "Type C Concrete Retaining Wall".

The concrete used for the retaining wall footing that extends into the approach and/or driveway pavement will be paid for at the contract unit price per square yard for the corresponding "PCC Approach Pavement" and/or "PCC Driveway Pavement" contract items.

December 23, 2019

<i>Published Date: 2nd Qtr. 2021</i>	<b>S D D O T</b>	<b>TYPE C CONCRETE RETAINING WALL</b>	PLATE NUMBER 530.01
			Sheet 3 of 3

File - ...trp03TKStdPlateSectionB.dgn



TYPE B CONCRETE CURB AND GUTTER				
Type	T <sub>1</sub> (Inches)	T <sub>2</sub> (Inches)	Cu. Yd. Per Lin. Ft.	Lin. Ft. Per Cu. Yd.
B66	6	5 <sup>1</sup> / <sub>16</sub>	0.057	17.7
B67	7	6 <sup>1</sup> / <sub>16</sub>	0.065	15.4
B68	8	7 <sup>1</sup> / <sub>16</sub>	0.073	13.7
B68.5	8.5	7 <sup>9</sup> / <sub>16</sub>	0.077	13.0
B69	9	8 <sup>1</sup> / <sub>16</sub>	0.081	12.3
B69.5	9.5	8 <sup>9</sup> / <sub>16</sub>	0.085	11.7
B610	10	9 <sup>1</sup> / <sub>16</sub>	0.090	11.2
B610.5	10.5	9 <sup>9</sup> / <sub>16</sub>	0.094	10.7
B611	11	10 <sup>1</sup> / <sub>16</sub>	0.098	10.2
B611.5	11.5	10 <sup>9</sup> / <sub>16</sub>	0.102	9.8
B612	12	11 <sup>1</sup> / <sub>16</sub>	0.106	9.4

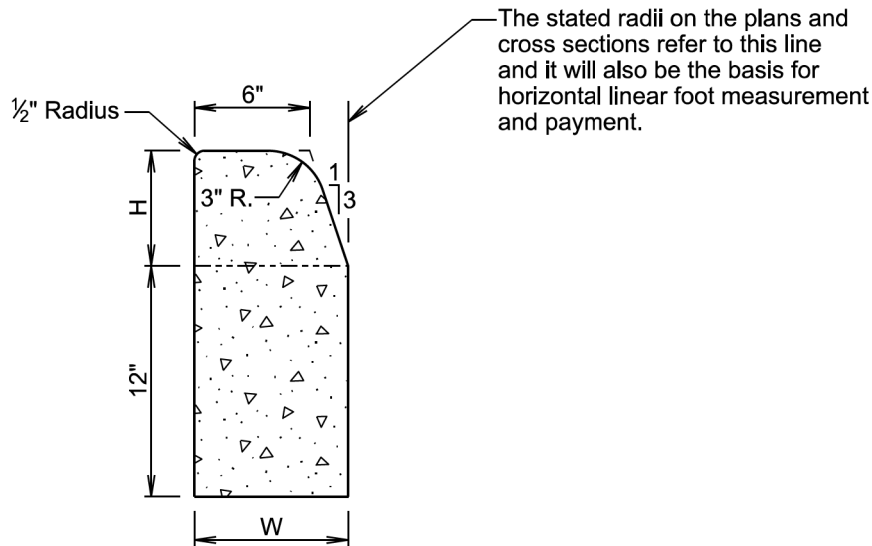
GENERAL NOTES:

When concrete curb and gutter longitudinally adjoins new concrete pavement, the method of attachment will be by one of the methods shown on standard plate 380.11.

See standard plate 650.90 for expansion and contraction joints in the curb and gutter.

December 23, 2019

Published Date: 2nd Qtr. 2021	S D D O T	TYPE B CONCRETE CURB AND GUTTER	PLATE NUMBER 650.01
			Sheet 1 of 1



TYPE B CONCRETE CURB				
Type	H (Inches)	W (Inches)	Cu. Yd. Per Lin. Ft.	Lin. Ft. Per Cu. Yd.
B6	6	8	0.0353	28.4
B7	7	8 <sup>3</sup> / <sub>8</sub>	0.0383	26.1
B8	8	8 <sup>5</sup> / <sub>8</sub>	0.0414	24.1
B9	9	9	0.0449	22.3
B10	10	9 <sup>3</sup> / <sub>8</sub>	0.0485	20.6

GENERAL NOTES:

The concrete for the type B concrete curb will comply with the requirements of the specifications for class M6 concrete.

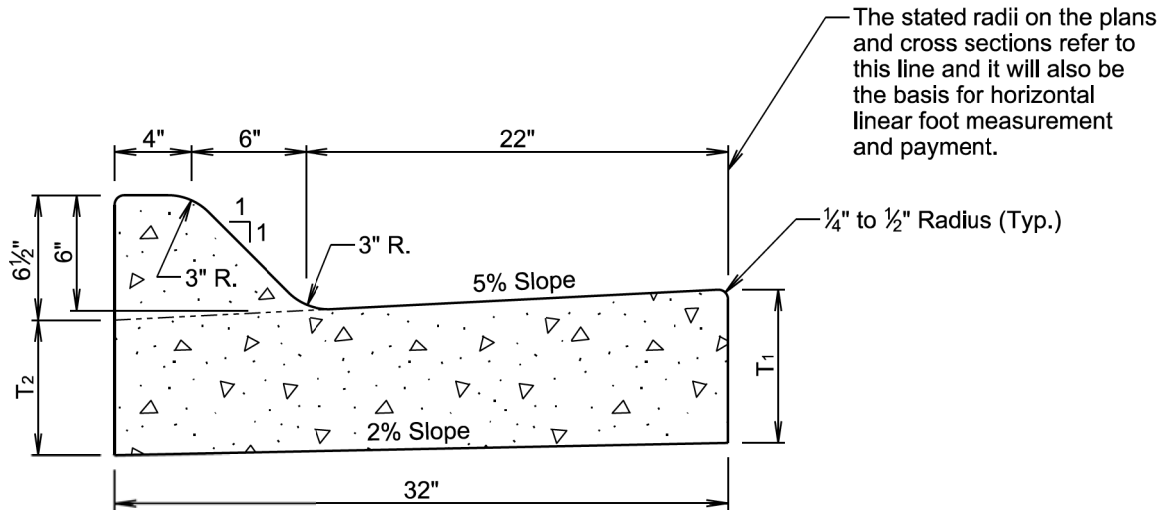
A 1/2" preformed expansion joint filler will be placed transversely in the curb at the following locations:

1. At each junction between the radius return of curb and curb which is parallel to the project centerline.
2. At each junction between the existing curb and new curb or curb and gutter.
3. At each junction between the curb and existing sidewalk to the depth of the sidewalk.

See standard plate 650.90 for contraction joints in the curb.

December 23, 2019

Published Date: 2nd Qtr. 2021	S D D O T	TYPE B CONCRETE CURB	PLATE NUMBER 650.02
			Sheet 1 of 1



TYPE F CONCRETE CURB AND GUTTER				
Type	T <sub>1</sub> (Inches)	T <sub>2</sub> (Inches)	Cu. Yd. Per Lin. Ft.	Lin. Ft. Per Cu. Yd.
F66	6	5 1/16	0.057	17.6
F67	7	6 1/16	0.065	15.4
F68	8	7 1/16	0.073	13.6
F68.5	8.5	7 9/16	0.077	12.9
F69	9	8 1/16	0.082	12.3
F69.5	9.5	8 5/16	0.086	11.7
F610	10	9 1/16	0.090	11.1
F610.5	10.5	9 5/16	0.094	10.7
F611	11	10 1/16	0.098	10.2
F611.5	11.5	10 5/16	0.102	9.8
F612	12	11 1/16	0.106	9.4

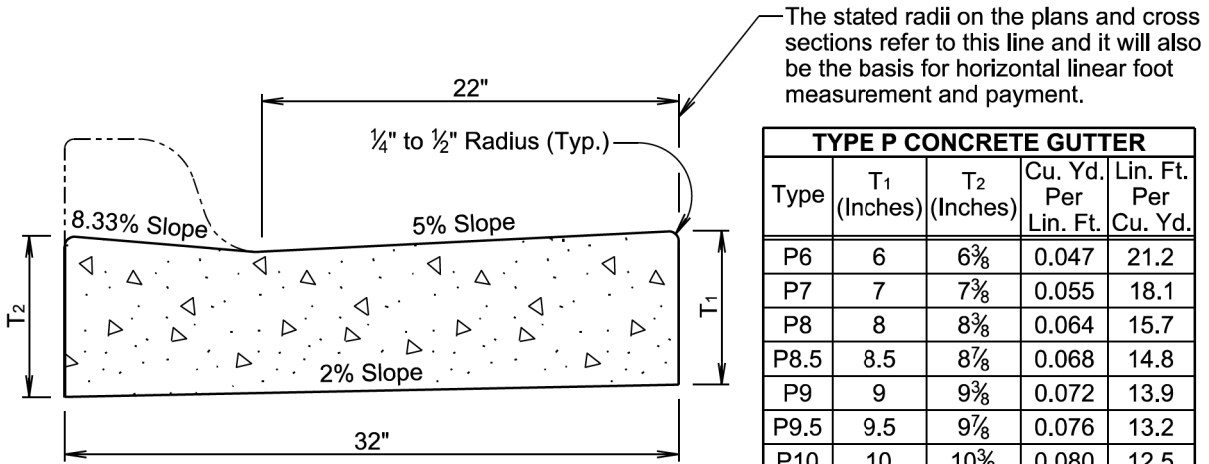
GENERAL NOTES:

When concrete curb and gutter longitudinally adjoins new concrete pavement, the method of attachment will be by one of the methods shown on standard plate 380.11.

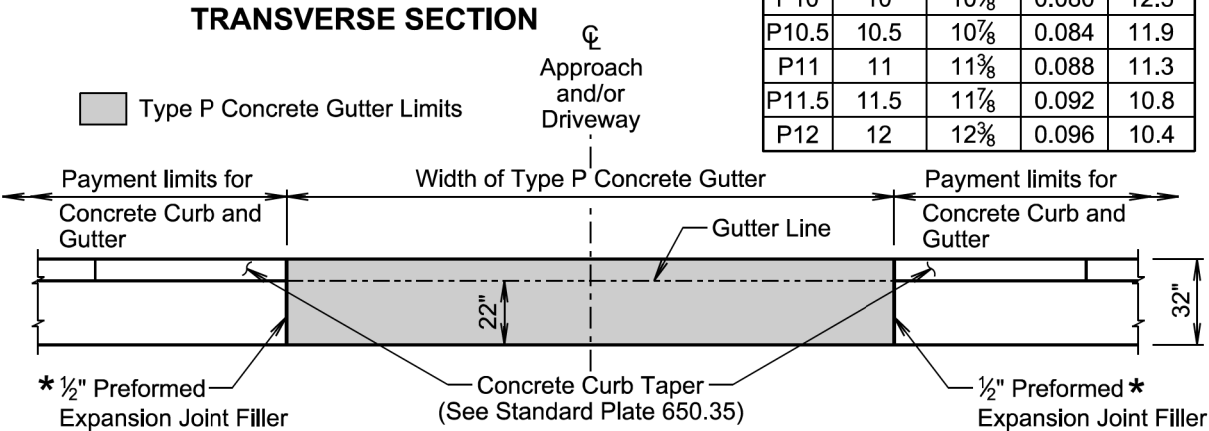
See standard plate 650.90 for expansion and contraction joints in the curb and gutter.

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Published Date: 2nd Qtr. 2021	S D D O T	TYPE F CONCRETE CURB AND GUTTER	PLATE NUMBER 650.20
			Sheet 1 of 1



TYPE P CONCRETE GUTTER				
Type	T <sub>1</sub> (Inches)	T <sub>2</sub> (Inches)	Cu. Yd. Per Lin. Ft.	Lin. Ft. Per Cu. Yd.
P6	6	6 3/8	0.047	21.2
P7	7	7 3/8	0.055	18.1
P8	8	8 3/8	0.064	15.7
P8.5	8.5	8 7/8	0.068	14.8
P9	9	9 3/8	0.072	13.9
P9.5	9.5	9 7/8	0.076	13.2
P10	10	10 3/8	0.080	12.5
P10.5	10.5	10 7/8	0.084	11.9
P11	11	11 3/8	0.088	11.3
P11.5	11.5	11 7/8	0.092	10.8
P12	12	12 3/8	0.096	10.4



\* Joint will not be needed if concrete curb and gutter and type P concrete gutter is placed at the same time. If the 1/2" preformed expansion joint filler is provided, then the joint will be sealed in accordance with standard plate 650.90.

GENERAL NOTES:

The concrete for the type P concrete gutter will comply with the requirements of the specifications for class M6 concrete.

When concrete gutter longitudinally adjoins new concrete pavement, the method of attachment will be by one of the methods shown on standard plate 380.11.

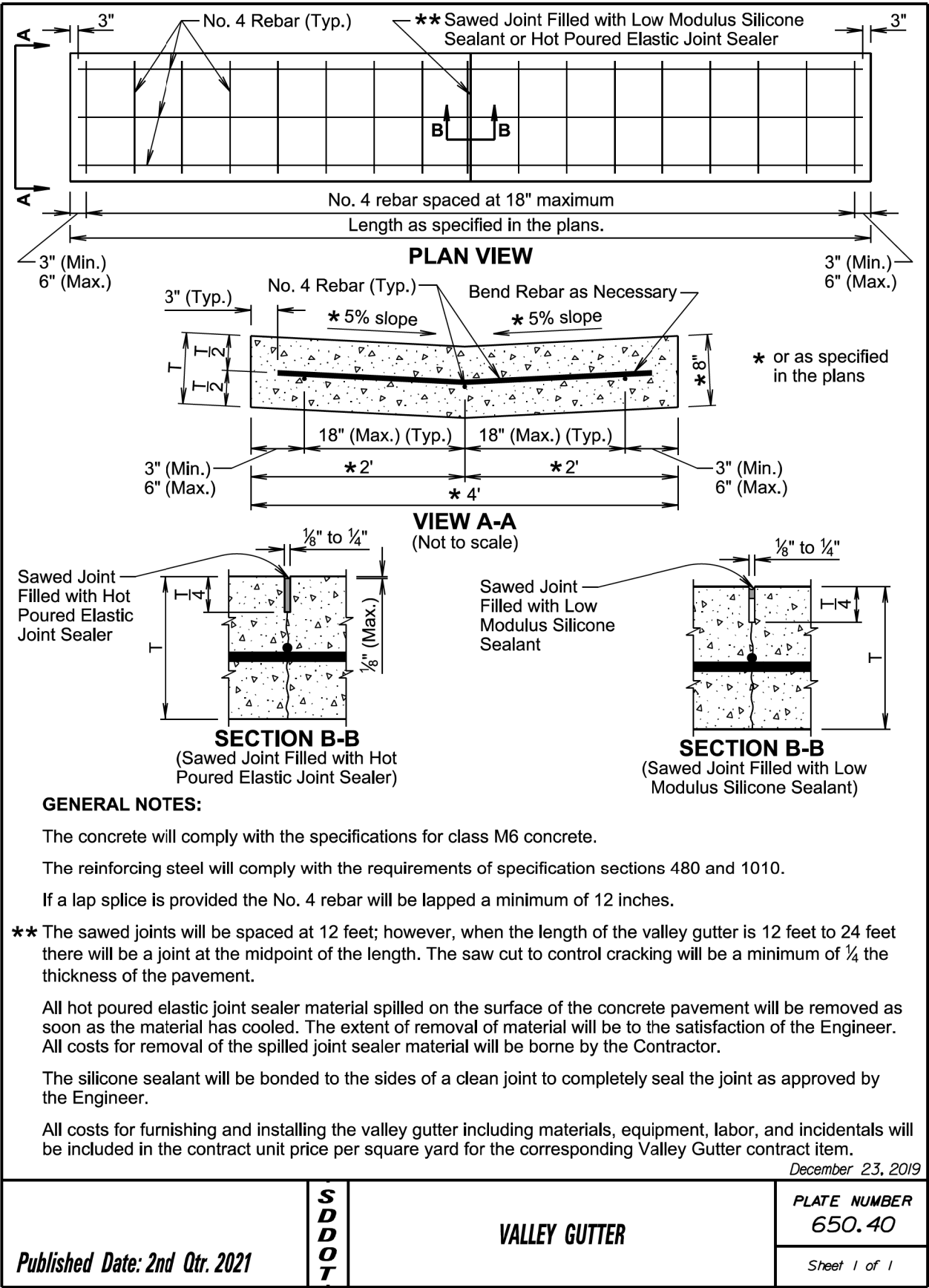
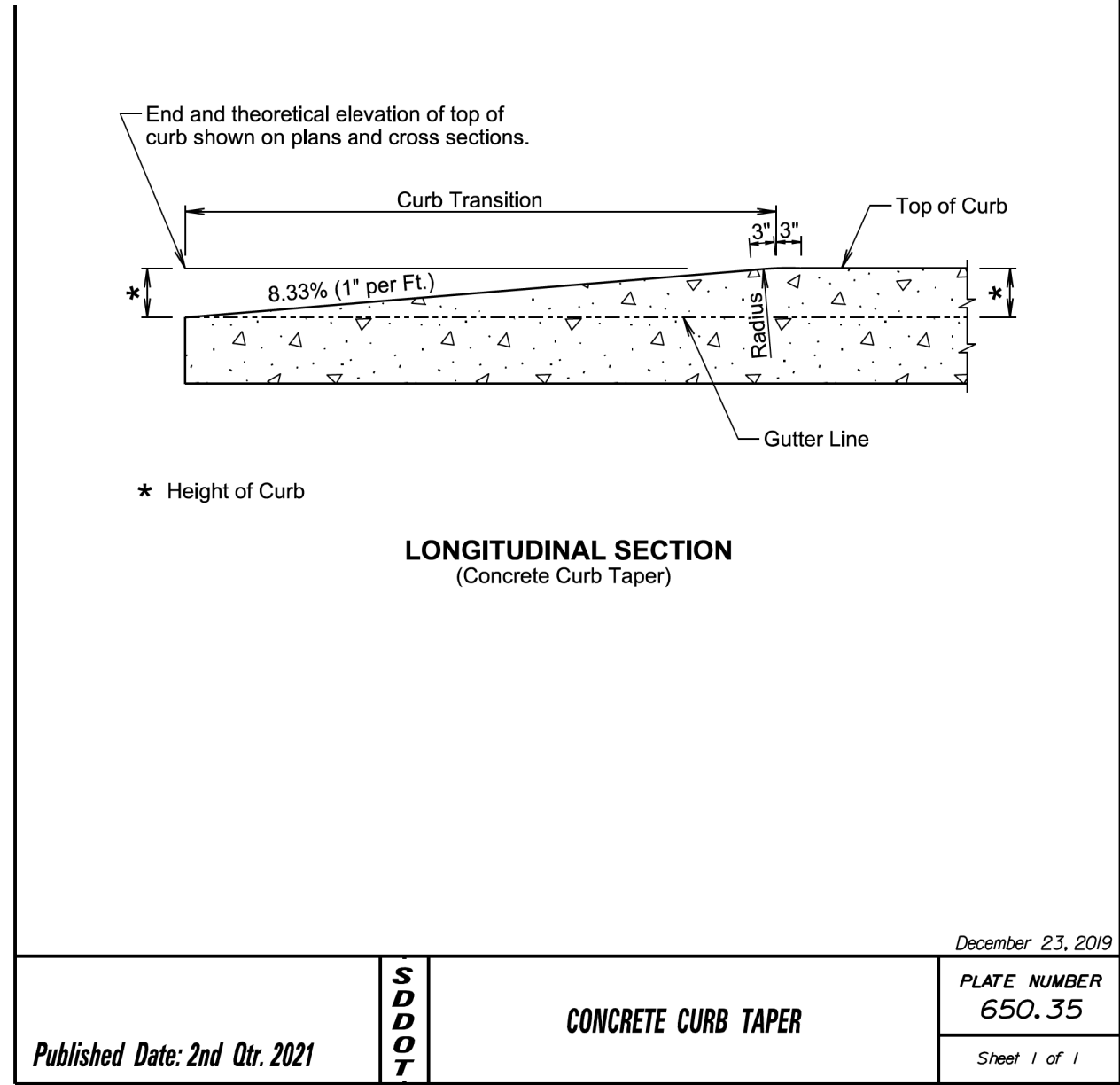
Transverse contraction joints will be constructed at 10-foot intervals in the concrete gutter except when concrete gutter is constructed adjacent to mainline PCC pavement. When concrete gutter is constructed adjacent to mainline PCC pavement, a transverse contraction joint will be constructed in the concrete gutter at each mainline PCC pavement transverse contraction joint location.

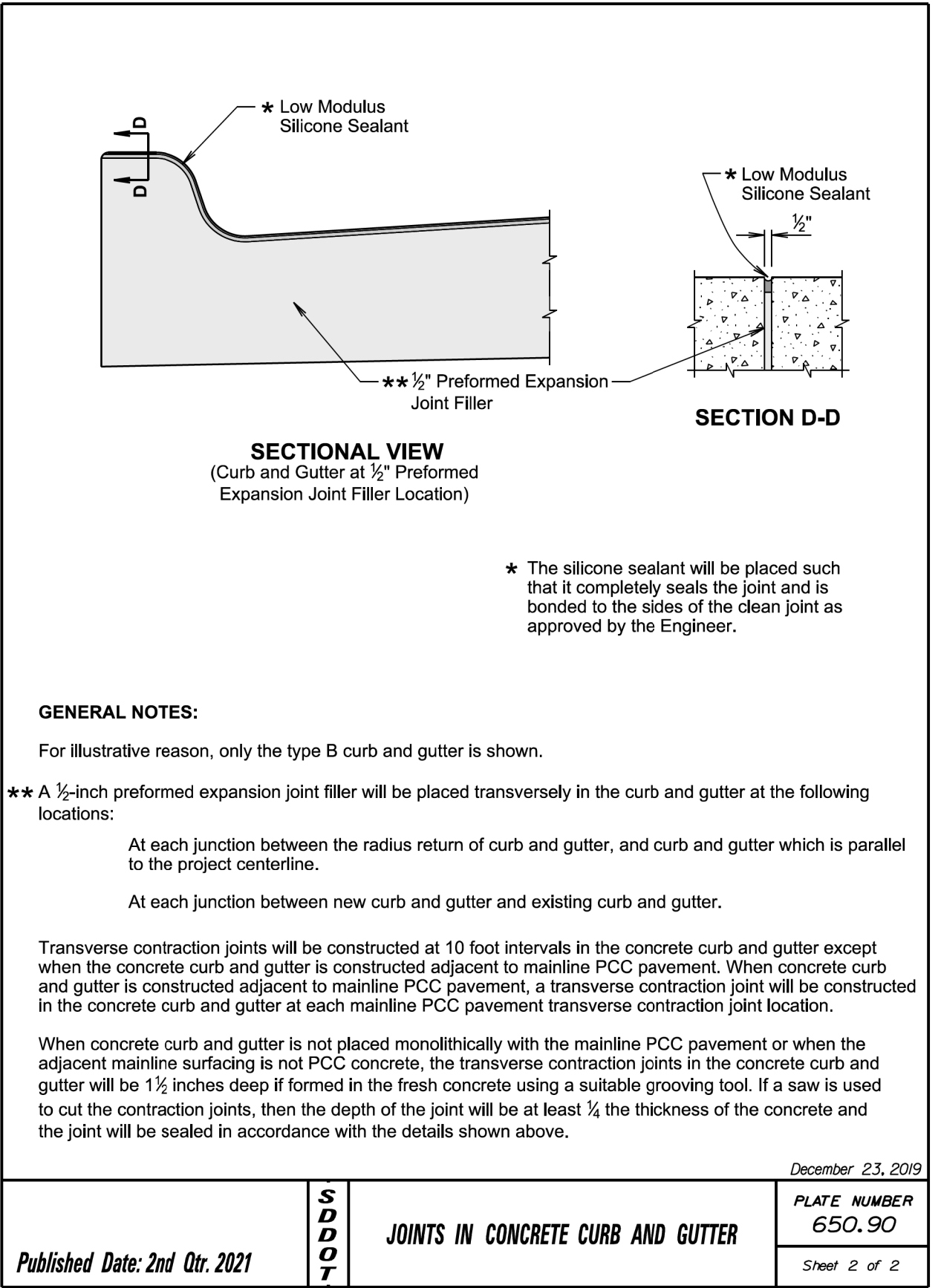
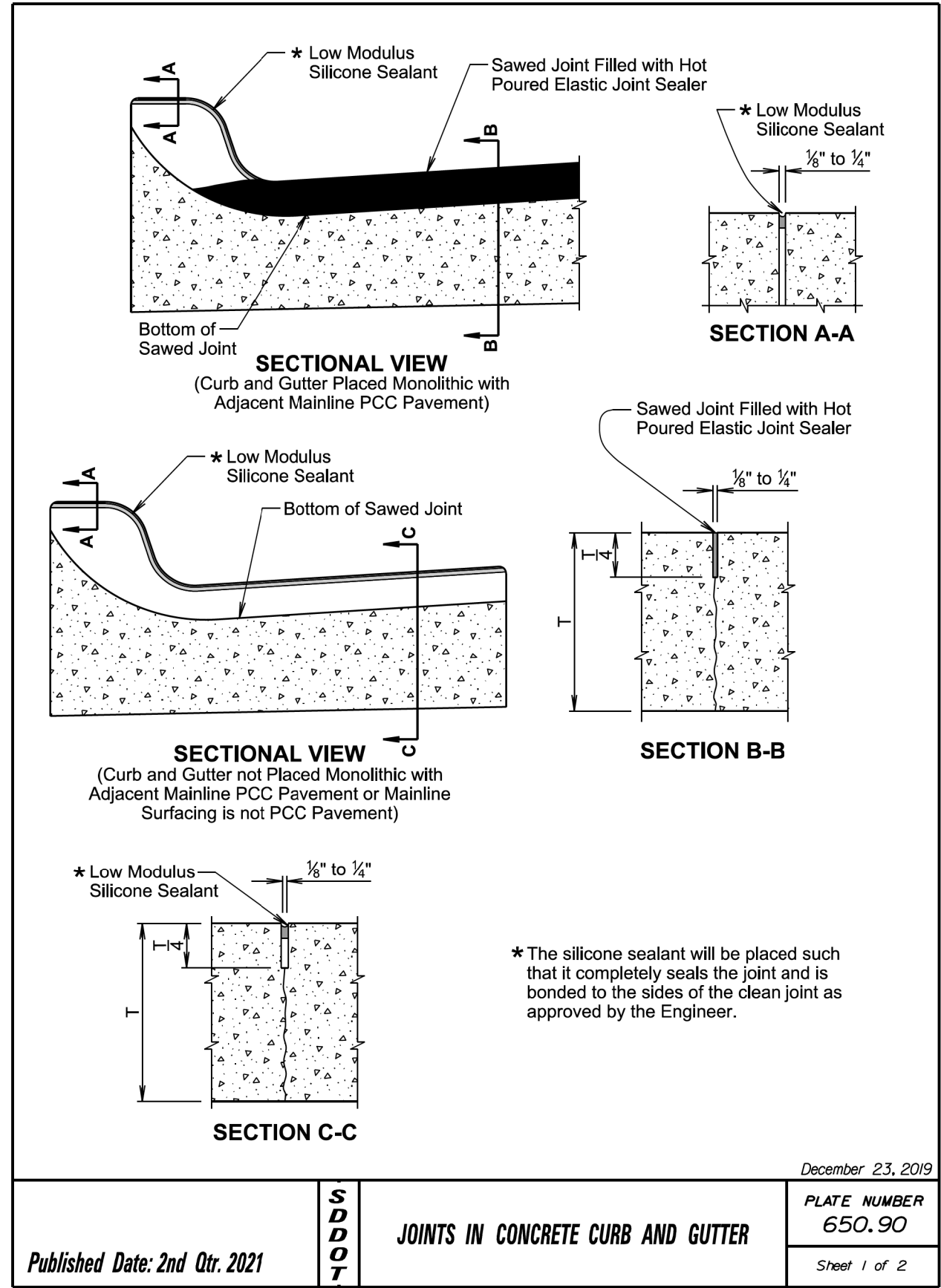
When concrete gutter is placed monolithically with mainline PCC pavement, the transverse contraction joints in the concrete gutter will be sawed and sealed the same as the transverse contraction joints in the mainline PCC pavement.

When concrete gutter is not placed monolithically with the mainline PCC pavement and when the adjacent mainline surfacing is not PCC concrete, the transverse contraction joints in the concrete gutter will be 1 1/2 inches deep if formed in the fresh concrete using a suitable grooving tool. If a saw is used to cut the contraction joints, then the depth of the joint will be at least 1/4 the thickness of the concrete.

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Published Date: 2nd Qtr. 2021	S D D O T	TYPE P CONCRETE GUTTER	PLATE NUMBER 650.30
			Sheet 1 of 1





\* The silicone sealant will be placed such that it completely seals the joint and is bonded to the sides of the clean joint as approved by the Engineer.

**GENERAL NOTES:**

For illustrative reason, only the type B curb and gutter is shown.

\*\* A 1/2-inch preformed expansion joint filler will be placed transversely in the curb and gutter at the following locations:

At each junction between the radius return of curb and gutter, and curb and gutter which is parallel to the project centerline.

At each junction between new curb and gutter and existing curb and gutter.

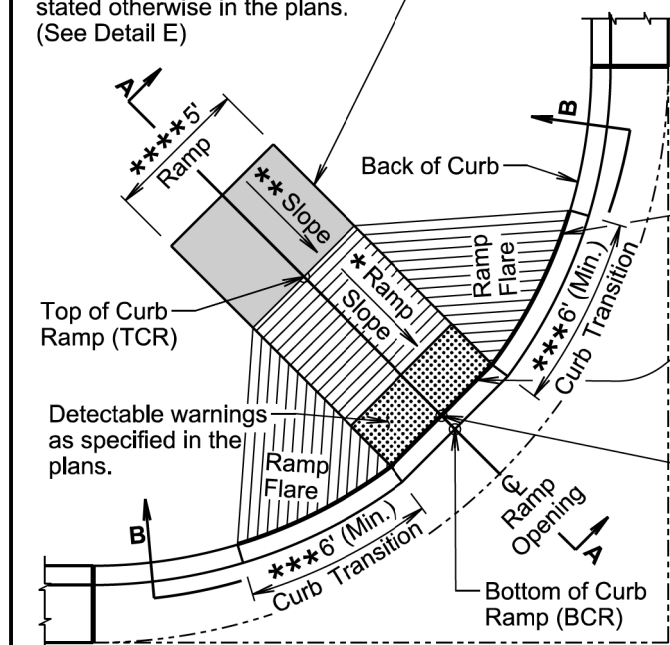
Transverse contraction joints will be constructed at 10 foot intervals in the concrete curb and gutter except when the concrete curb and gutter is constructed adjacent to mainline PCC pavement. When concrete curb and gutter is constructed adjacent to mainline PCC pavement, a transverse contraction joint will be constructed in the concrete curb and gutter at each mainline PCC pavement transverse contraction joint location.

When concrete curb and gutter is not placed monolithically with the mainline PCC pavement or when the adjacent mainline surfacing is not PCC concrete, the transverse contraction joints in the concrete curb and gutter will be 1 1/2 inches deep if formed in the fresh concrete using a suitable grooving tool. If a saw is used to cut the contraction joints, then the depth of the joint will be at least 1/4 the thickness of the concrete and the joint will be sealed in accordance with the details shown above.



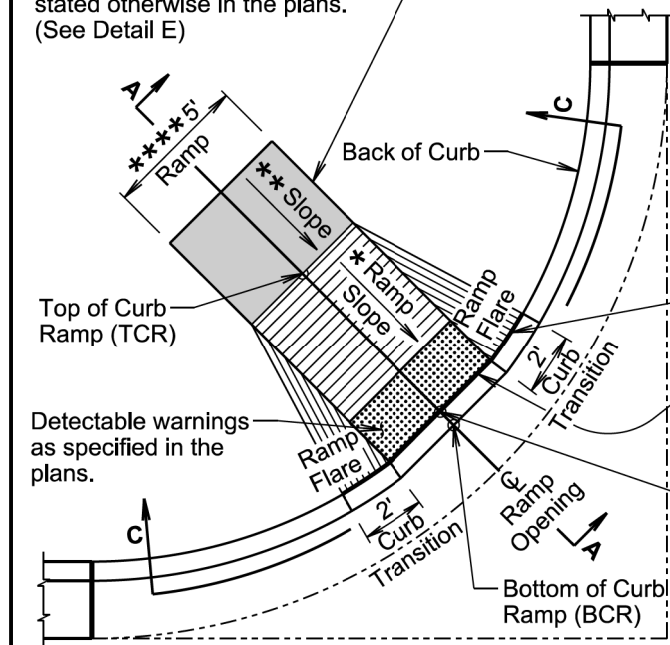
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0018(191)250 P 0044(188)253		
Plotting Date: 05/17/2021		B171	B196

The turning space is 5'x5' unless stated otherwise in the plans. (See Detail E)



**PLAN VIEW**  
(With 6'+ Curb Transition)

The turning space is 5'x5' unless stated otherwise in the plans. (See Detail E)

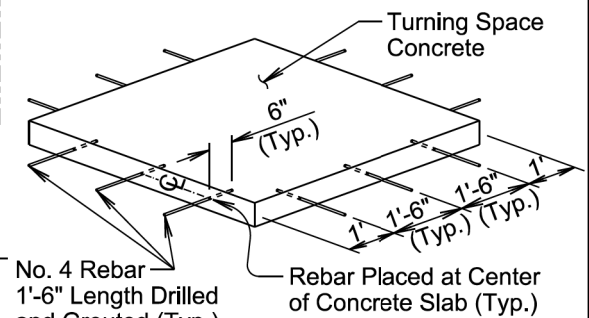


**PLAN VIEW**  
(With 2' Curb Transition)

1/2" Preformed Expansion Joint Filler (See specifications and standard plate 651.75)

The edge of the curb and gutter concrete adjacent to the type 1 detectable warnings will be straight, but may be curved when using type 2 detectable warnings.

Reference point for location of curb ramp as shown in the plans.



**DETAIL E  
ISOMETRIC VIEW**  
(If turning space concrete is placed monolithic with surrounding concrete, then this detail is not necessary.)

1/2" Preformed Expansion Joint Filler (See specifications and standard plate 651.75)

The edge of the curb and gutter concrete adjacent to the type 1 detectable warnings will be straight, but may be curved when using type 2 detectable warnings.

Reference point for location of curb ramp as shown in the plans.

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Published Date: 2nd Qtr. 2021	S D D O T	TYPE 1 CURB RAMP (PERPENDICULAR CURB RAMP)	PLATE NUMBER 651.01
			Sheet 1 of 3

Curb ramp slopes are designed at 7.5% unless stated otherwise in the plans. The curb ramp may have a maximum slope of 8.3% and will not exceed 15' in length unless stated otherwise in the plans.

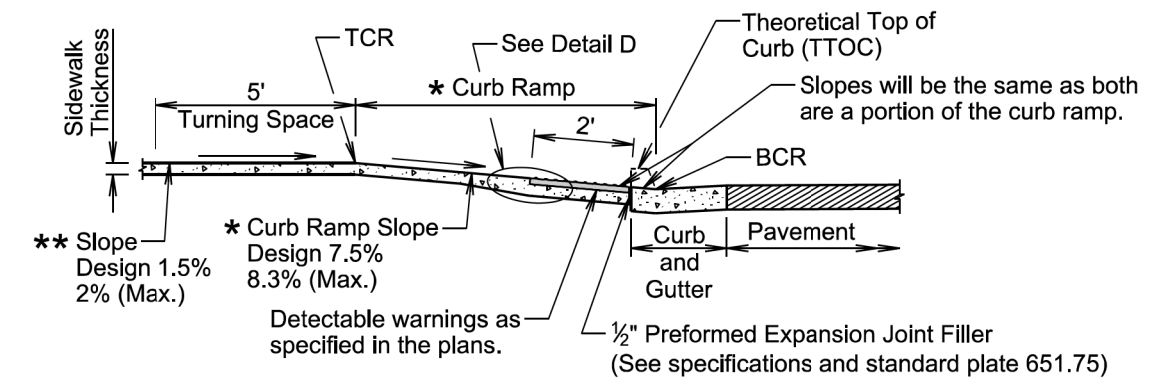
\* The curb ramp length may be computed based on the intersection of a continuous 1.5% theoretical slope from theoretical top of curb (TTOC) with the curb ramp using a continuous 7.5% curb ramp slope. The elevation of point TCR will always be higher than the elevation of point TTOC unless specified otherwise in the plans. The curb ramp length dimension as shown in the plans will be adjusted as necessary to meet all slope and length requirements based on field geometrics.

The cross slope of the ramp will not be steeper than 2%. Plans are designed using a 1.5% slope unless stated otherwise in the plans.

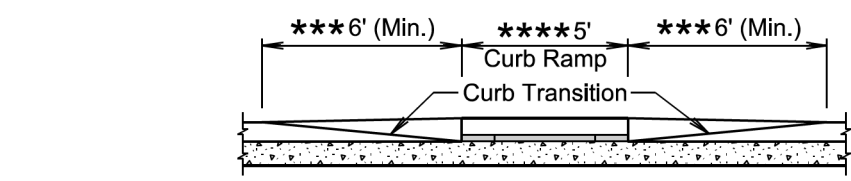
\*\* The slope in the turning space will not be steeper than 2% in any direction of pedestrian travel. Plans are designed using a 1.5% slope unless stated otherwise in the plans.

\*\*\* The curb transition will be a minimum of 6' long, a maximum of 10' long, and the curb transition slope will not be steeper than 10% unless stated otherwise in the plans. The curb transition length will be adjusted as necessary to meet slope and length requirements based on field geometrics.

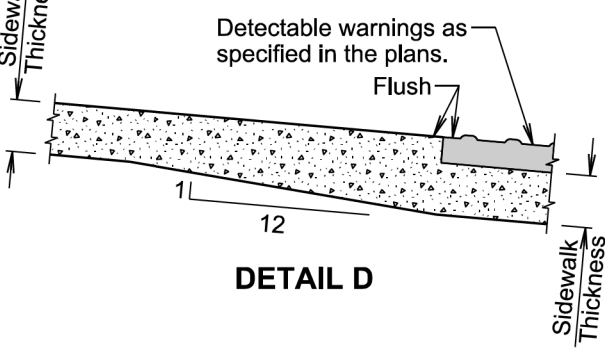
\*\*\*\* The ramp width is 5' unless stated otherwise in the plans.



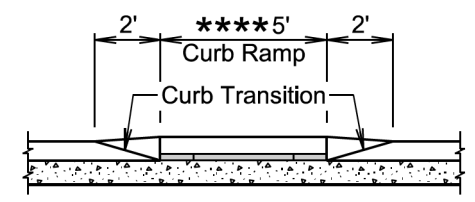
**SECTION A-A**



**SECTIONAL VIEW B-B**



**DETAIL D**



**SECTIONAL VIEW C-C**

February 14, 2020

Published Date: 2nd Qtr. 2021	S D D O T	TYPE 1 CURB RAMP (PERPENDICULAR CURB RAMP)	PLATE NUMBER 651.01
			Sheet 2 of 3

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**GENERAL NOTES:**

For illustrative purpose only, type 1 detectable warnings are shown in the drawings.

For illustrative purpose only, PCC fillet sections are shown in the drawings. The curb ramp depicted on this standard plate may be used with a PCC fillet section or curb and gutter.

For illustrative purpose only, the curb ramp location is shown at the center of a PCC fillet section. The curb ramp will be placed at the location stated in the plans.

Sidewalk will not be placed adjacent to the curb ramp flares when a 2-foot curb transition is used unless shown otherwise in the plans.

★ Care will be taken to ensure a uniform grade on the curb ramp, free of sags and short grade changes.

Surface texture of the curb ramp will be obtained by coarse brooming transverse to the slope of the curb ramp.

The normal gutter line profile will be maintained through the area of the ramp opening.

Joints will be sawed or tooled into the concrete adjacent to the detectable warnings to alleviate possible corner cracking.

Care will be taken to ensure that the surface of the detectable warnings are clean and maintains a uniform color.

The detectable warnings will be cut as necessary to fit the plan specified limits of the detectable warnings. Cost for cutting the detectable warnings will be incidental to the corresponding detectable warning contract item.

There will be no separate payment for curb ramps. The curb ramp will be measured and paid for at the contract unit price per square foot for the corresponding concrete sidewalk contract item. The square foot area of the detectable warnings will be included in the measured and paid for quantity of sidewalk.

If rebar is placed in the turning space as depicted in detail E, the cost of the materials, labor, and equipment to furnish and install the rebar will be incidental to the contract unit price per square foot for the corresponding concrete sidewalk contract item.

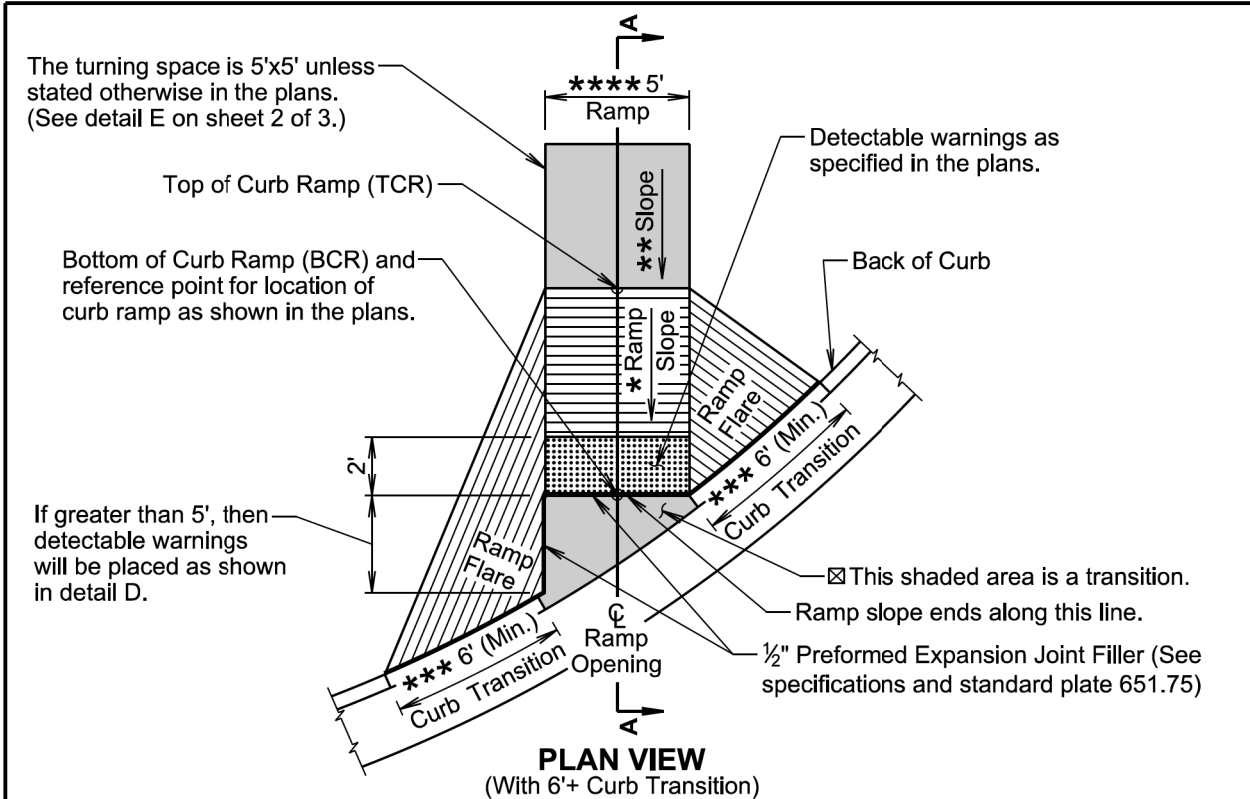
The curb transitions and ramp opening will be measured and paid for at the contract unit price per foot for the corresponding curb and gutter contract item when curb and gutter is used. The curb transitions and ramp opening will be measured and paid for at the contract unit price per square yard for the corresponding PCC fillet section contract item when a PCC fillet section is used.

The type 1 detectable warnings will be measured to the nearest square foot. All costs for furnishing and installing the type 1 detectable warnings including labor, equipment, materials, and incidentals will be paid for at the contract unit price per square foot for "Type 1 Detectable Warnings".

The type 2 detectable warnings will be measured to the nearest square foot. All costs for furnishing and installing the type 2 detectable warnings including labor, equipment, and materials, including adhesive, necessary sealant or grout, and necessary grinding will be paid for at the contract unit price per square foot for "Type 2 Detectable Warnings".

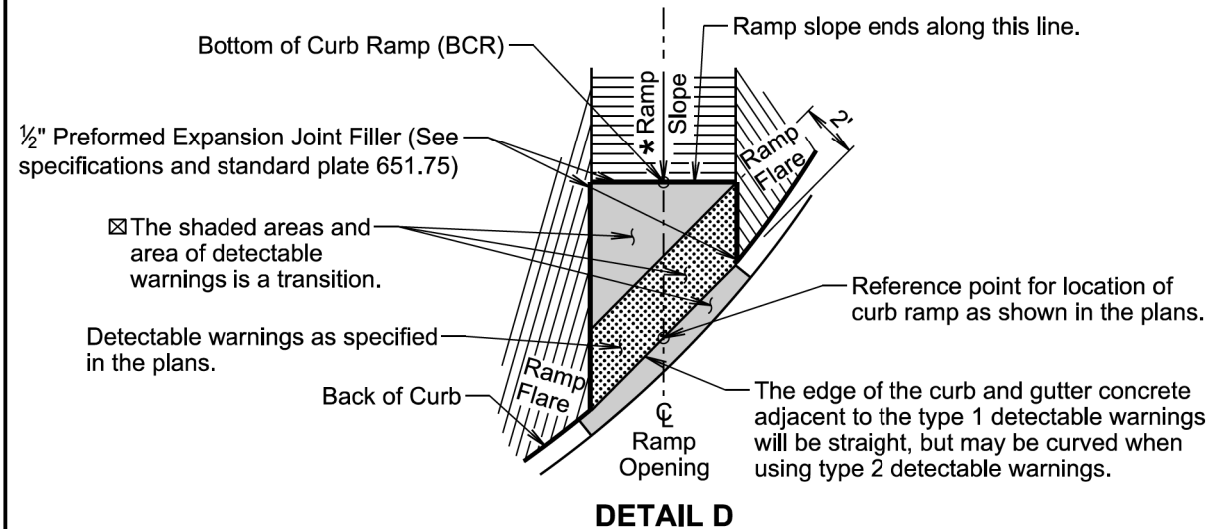
February 14, 2020

<i>Published Date: 2nd Qtr. 2021</i>	<b>S D D O T</b>	<b>TYPE 1 CURB RAMP (PERPENDICULAR CURB RAMP)</b>	PLATE NUMBER 651.01
			Sheet 3 of 3



★ The slope within the transition area will not be steeper than 5%. The concrete within the transition will be placed monolithic with the curb and gutter or fillet section concrete. The concrete thickness within the transition will be the same as the curb and gutter or fillet section concrete thickness.

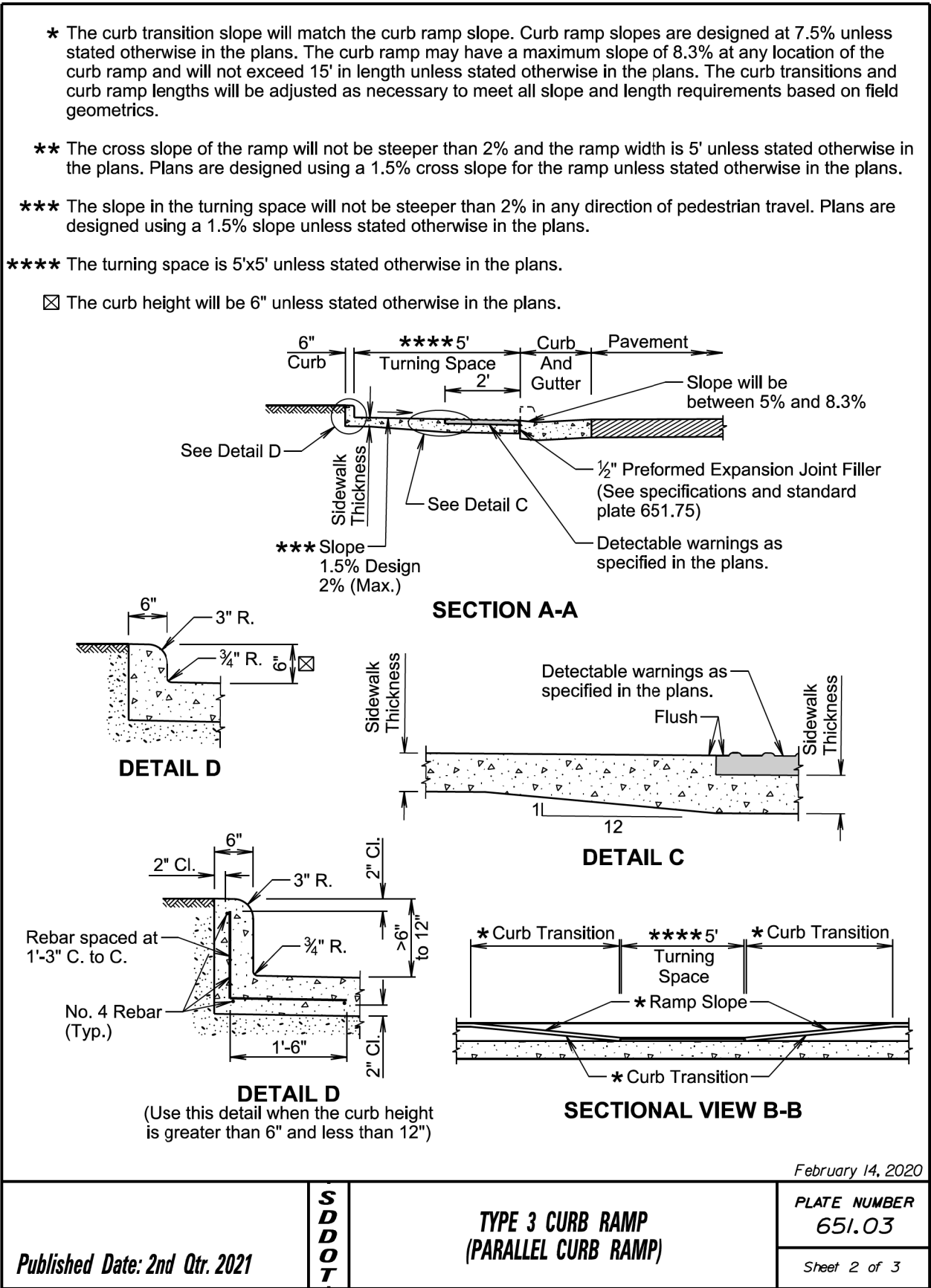
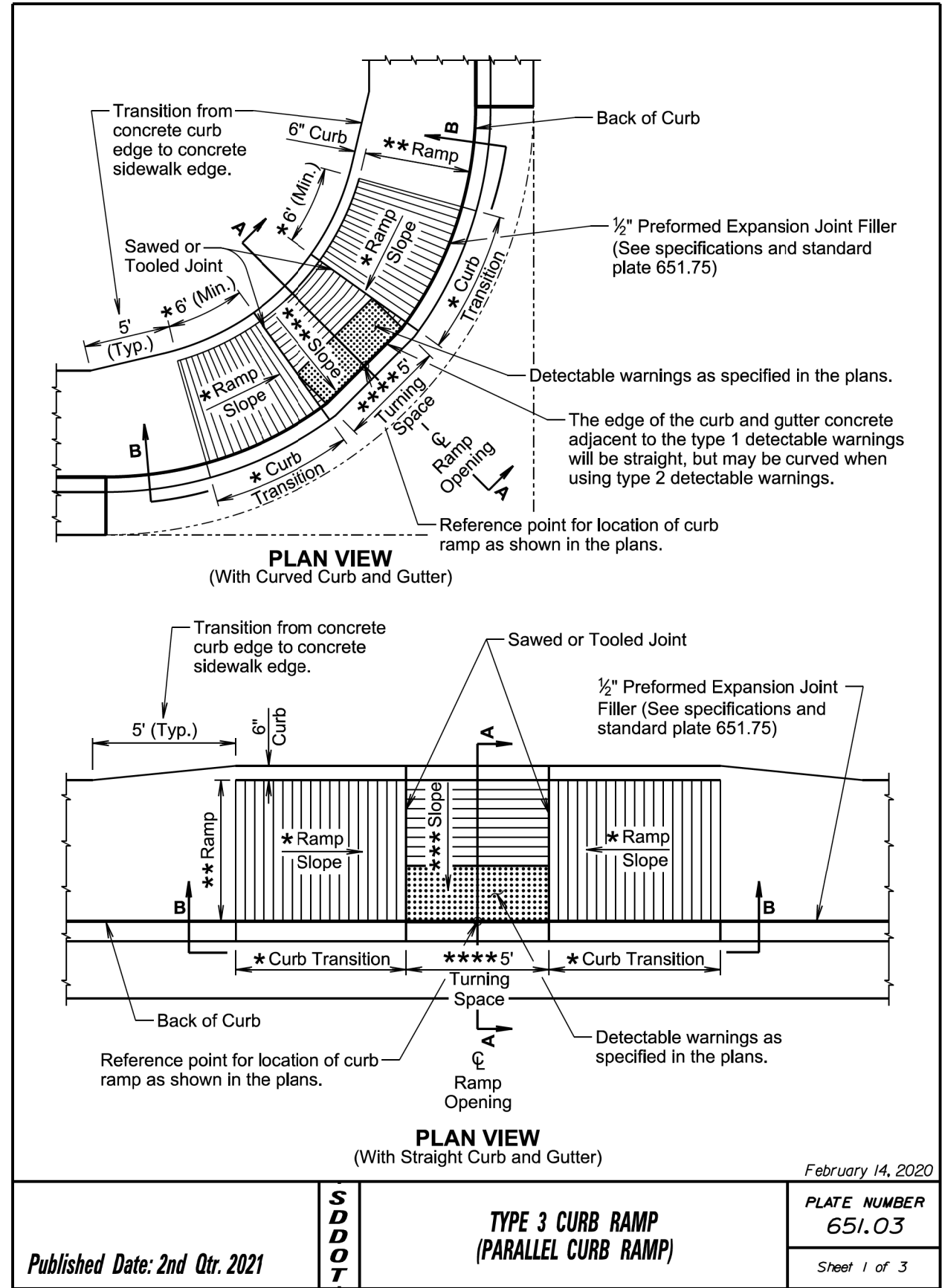
★★★ The curb transition will be a minimum of 6' long, a maximum of 10' long, and the curb transition slope will not be steeper than 10% unless stated otherwise in the plans. The curb transition length will be adjusted as necessary to meet slope and length requirements based on field geometrics.



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<i>Published Date: 2nd Qtr. 2021</i>	<b>S D D O T</b>	<b>TYPE 2 CURB RAMP (DIRECTIONAL CURB RAMP)</b>	PLATE NUMBER 651.02
			Sheet 1 of 3





1:200  
Plot Scale -  
Plotted From -

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0018(191)250 P 0044(188)253		

Plotting Date: 05/17/2021

#### GENERAL NOTES:

For illustrative purpose only, type 1 detectable warnings are shown in the drawings.

For illustrative purpose only, a PCC fillet section is shown in one of the drawings. The curb ramp depicted on this standard plate may be used with a PCC fillet section or with curb and gutter.

The curb ramp will be placed at the location stated in the plans.

Sidewalk adjacent to the curb ramp will be as shown in the plans.

Care will be taken to ensure a uniform grade on the curb ramp, free of sags and short grade changes.

Surface texture of the curb ramp will be obtained by coarse brooming transverse to the slope of the curb ramp.

The normal gutter line profile will be maintained through the area of the ramp opening.

Joints will be sawed or tooled into the concrete adjacent to the detectable warnings to alleviate possible corner cracking (see plan view for joint location).

Care will be taken to ensure that the surface of the detectable warnings are clean and maintains a uniform color.

The detectable warnings will be cut as necessary to fit the plan specified limits of the detectable warnings. Cost for cutting the detectable warnings will be incidental to the corresponding detectable warning contract item.

When curb height is greater than 6" and less than 12", reinforcing steel is required in accordance with the detail on sheet 2 of 3. The reinforcing steel will conform to ASTM A615, Grade 60. Cost for furnishing and installing the reinforcing steel will be incidental to the contract unit price per square foot for the corresponding concrete sidewalk contract item.

There will be no separate payment for curb ramps. The curb ramp will be measured and paid for at the contract unit price per square foot for the corresponding concrete sidewalk contract item. The square foot area of the detectable warnings and the curb along the short radius will be included in the measured and paid for quantity of sidewalk.

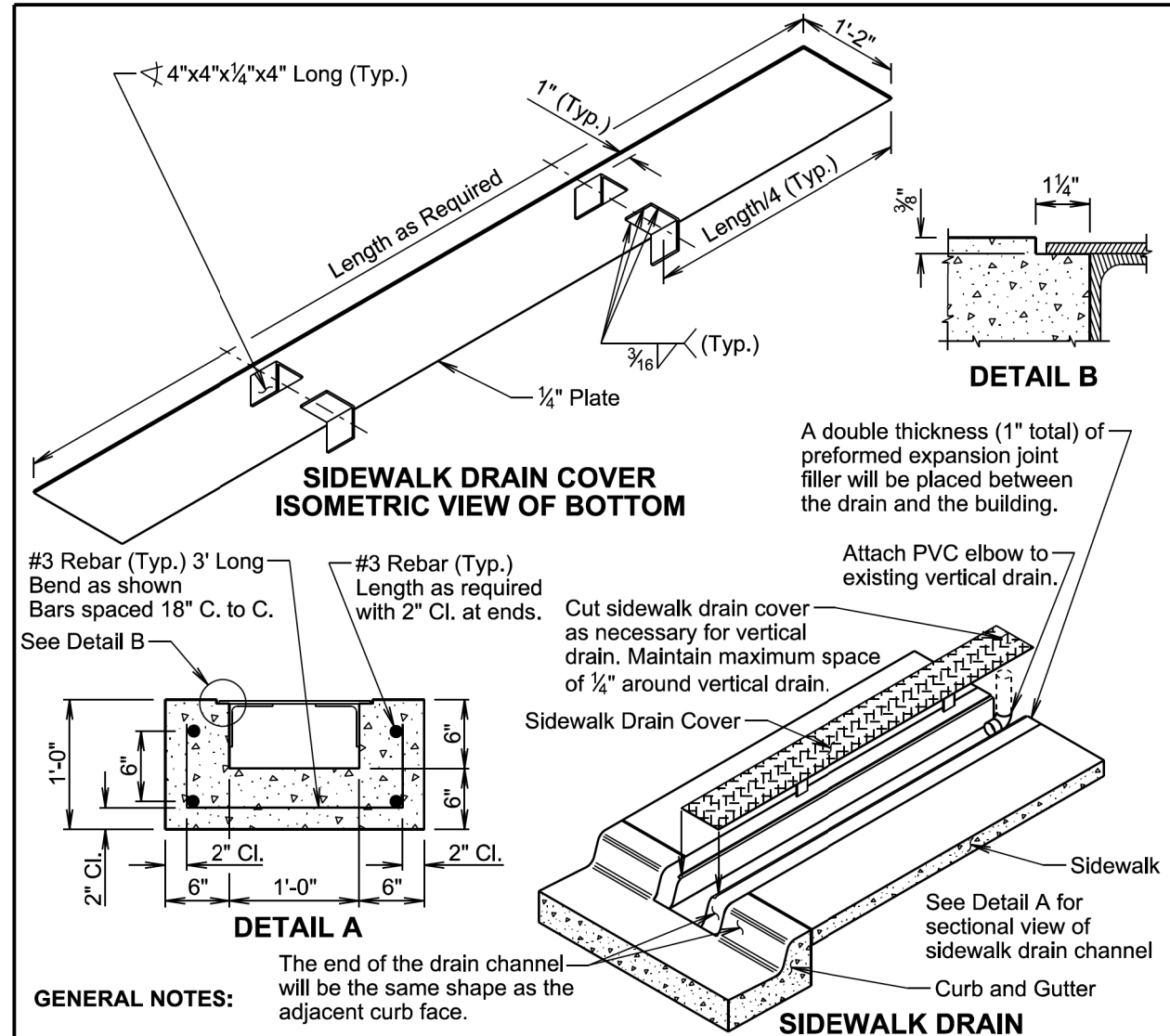
The curb transitions and ramp opening will be measured and paid for at the contract unit price per foot for the corresponding curb and gutter contract item when curb and gutter is used. The curb transitions and ramp opening will be measured and paid for at the contract unit price per square yard for the corresponding PCC fillet section contract item when a PCC fillet section is used.

The type 1 detectable warnings will be measured to the nearest square foot. All costs for furnishing and installing the type 1 detectable warnings including labor, equipment, materials, and incidentals will be paid for at the contract unit price per square foot for "Type 1 Detectable Warnings".

The type 2 detectable warnings will be measured to the nearest square foot. All costs for furnishing and installing the type 2 detectable warnings including labor, equipment, and materials, including adhesive, necessary sealant or grout, and necessary grinding will be paid for at the contract unit price per square foot for "Type 2 Detectable Warnings".

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<i>Published Date: 2nd Qtr. 2021</i>	<b>S D D O T</b>	<b>TYPE 3 CURB RAMP (PARALLEL CURB RAMP)</b>	PLATE NUMBER 651.03
			Sheet 3 of 3



#### GENERAL NOTES:

Concrete will be Class M6 in accordance with Section 462 of the Specifications.

Reinforcing steel will conform to ASTM A615, Grade 60.

Structural Steel will conform to ASTM A36. The sidewalk drain cover will conform to ASTM A786.

Welding and weld inspection will be in conformance with the current edition of the AWS D1.1 Structural Welding Code-Steel.

The cover plate assembly will be galvanized after fabrication. Galvanizing will be in accordance with ASTM A123.

All costs associated for providing the required curb cut will be incidental to the contract unit price per foot for the corresponding curb and gutter contract item.

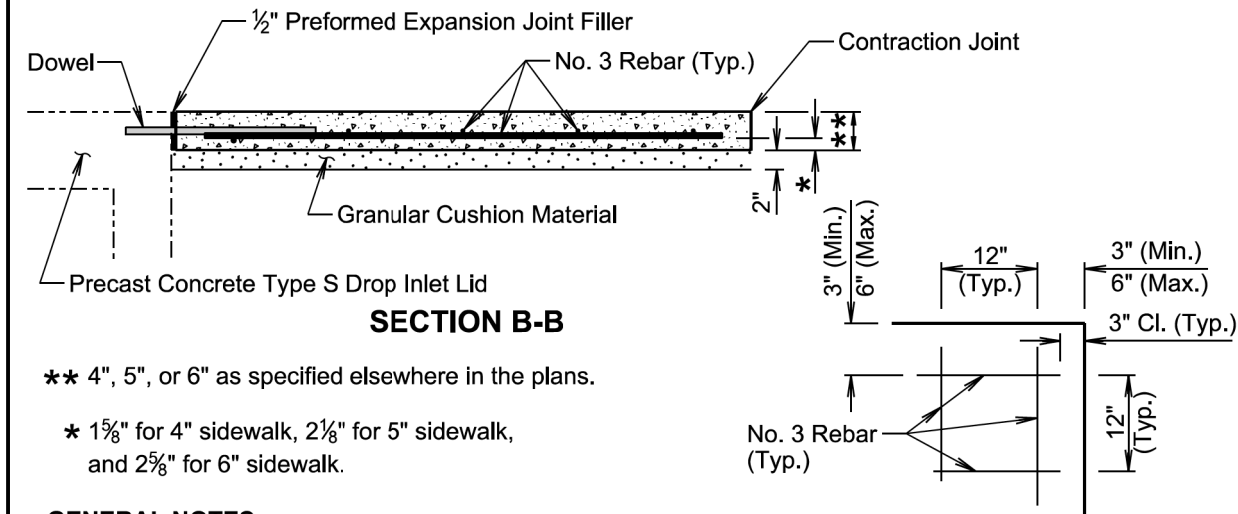
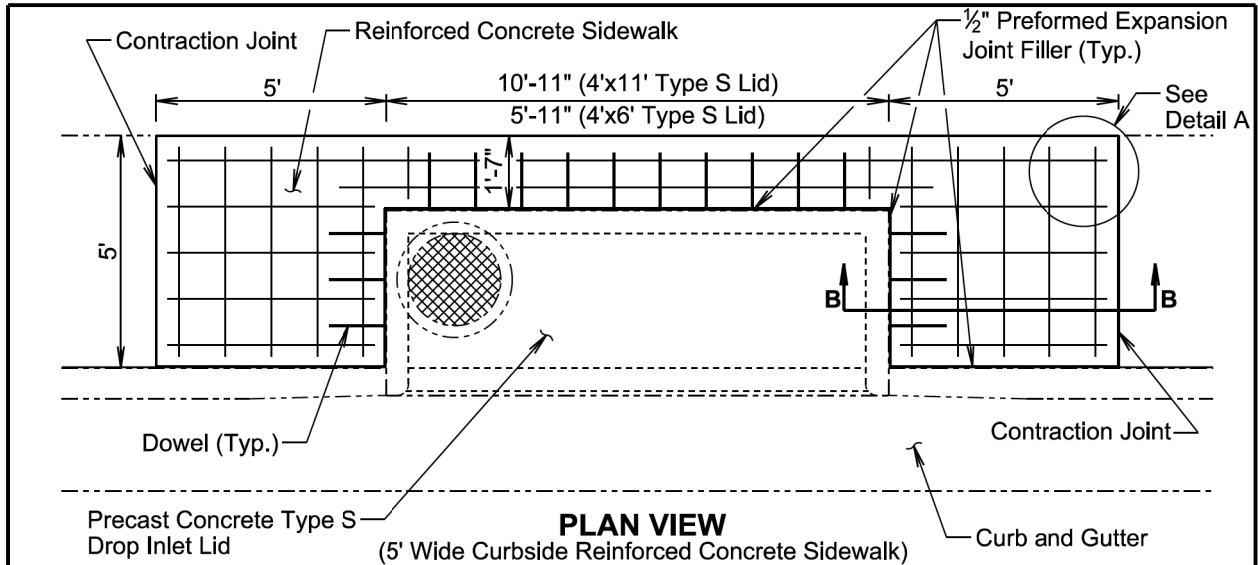
The sidewalk drain will be measured and paid for to the nearest tenth of a foot. The length of the drain will be measured from the gutter to the necessary end location adjacent to the building. All costs associated with furnishing and installing the sidewalk drain channel and cover including the attachment to the vertical drain will be incidental to the contract unit price per foot for "Sidewalk Drain".

February 14, 2020

<i>Published Date: 2nd Qtr. 2021</i>	<b>S D D O T</b>	<b>SIDEWALK DRAIN</b>	PLATE NUMBER 651.50
			Sheet 1 of 1

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	NH 0018(191)250 P 0044(188)253	B176	B196

Plotting Date: 05/17/2021



★★ 4", 5", or 6" as specified elsewhere in the plans.

★ 1 5/8" for 4" sidewalk, 2 1/8" for 5" sidewalk, and 2 5/8" for 6" sidewalk.

**GENERAL NOTES:**

The precast concrete Type S lids shown are 4'x11' for illustrative purpose.

The cross slope of the sidewalk and precast concrete type S drop inlet lid will be as specified elsewhere in the plans.

The reinforcing steel will conform to Section 1010 of the Specifications. The Contractor will be in conformance with the construction requirements of Section 480.3 of the Specifications.

When lapping of reinforcing steel is necessary, the No. 3 rebar will be lapped 12".

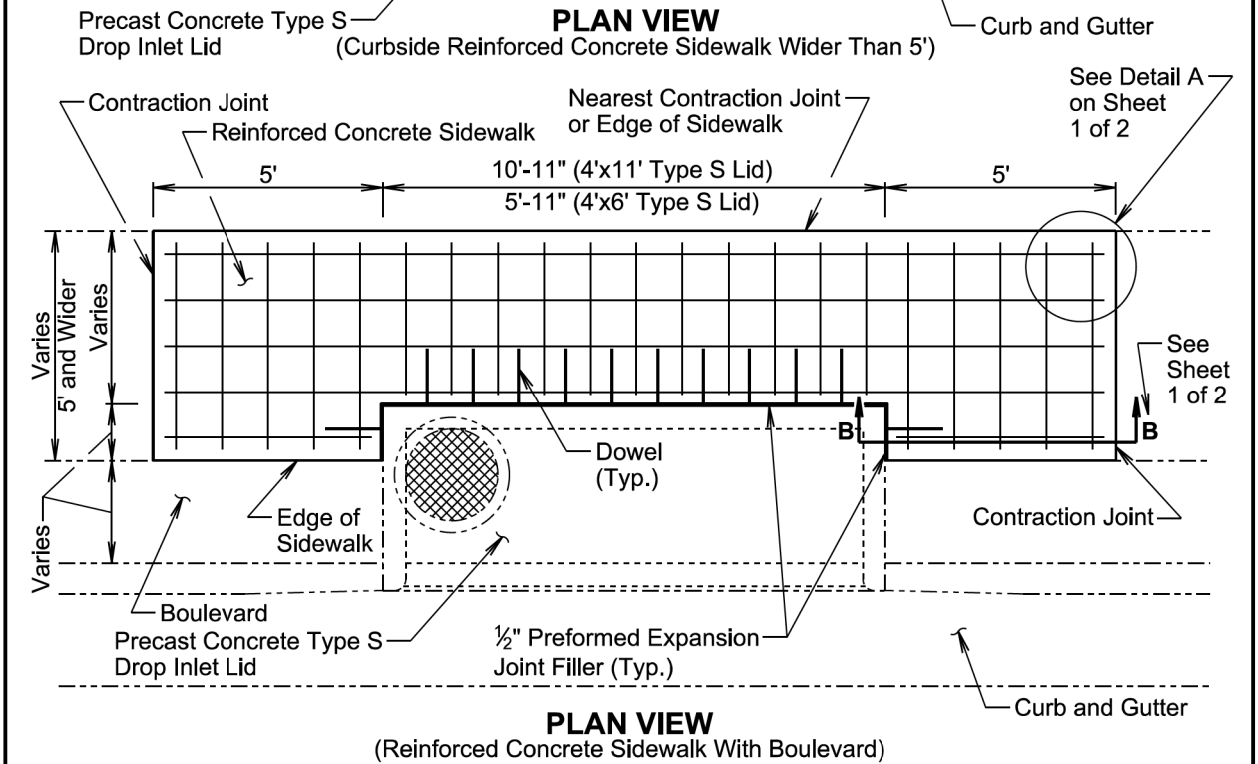
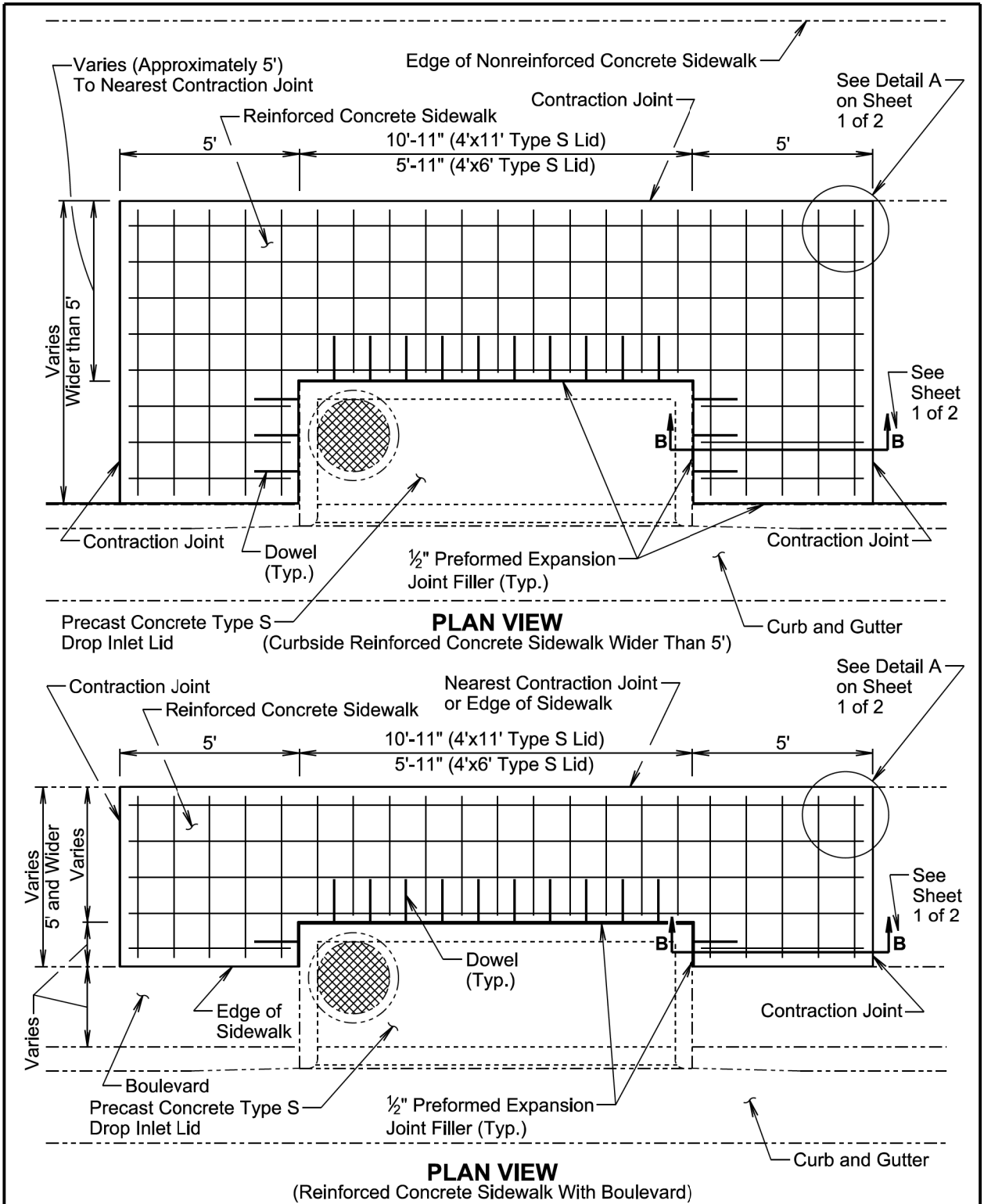
The reinforced concrete sidewalk will conform to the requirements of Section 651 of the Specifications.

All costs for constructing the reinforced concrete sidewalk including labor, equipment, tools, backfilling, furnishing and placing materials, including granular cushion, reinforcing steel, preformed expansion joint filler, and incidentals will be included in the contract unit price per square foot for the corresponding reinforced concrete sidewalk contract item.

February 14, 2020

<b>S D D O T</b>	<b>REINFORCED CONCRETE SIDEWALK ADJACENT TO PRECAST CONCRETE TYPE S DROP INLET LID</b>	PLATE NUMBER 651.70
		Sheet 1 of 2

Published Date: 2nd Qtr. 2021

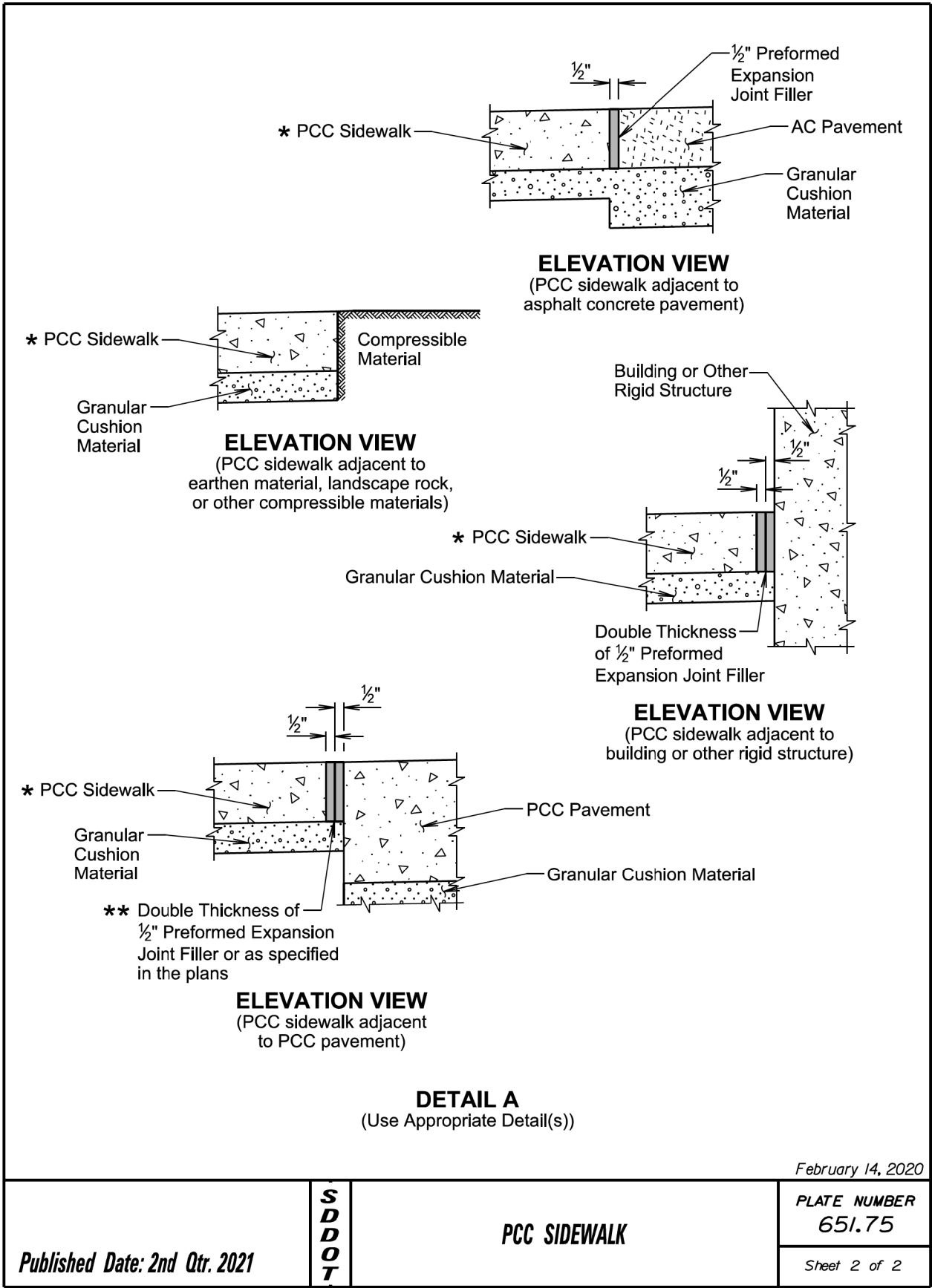
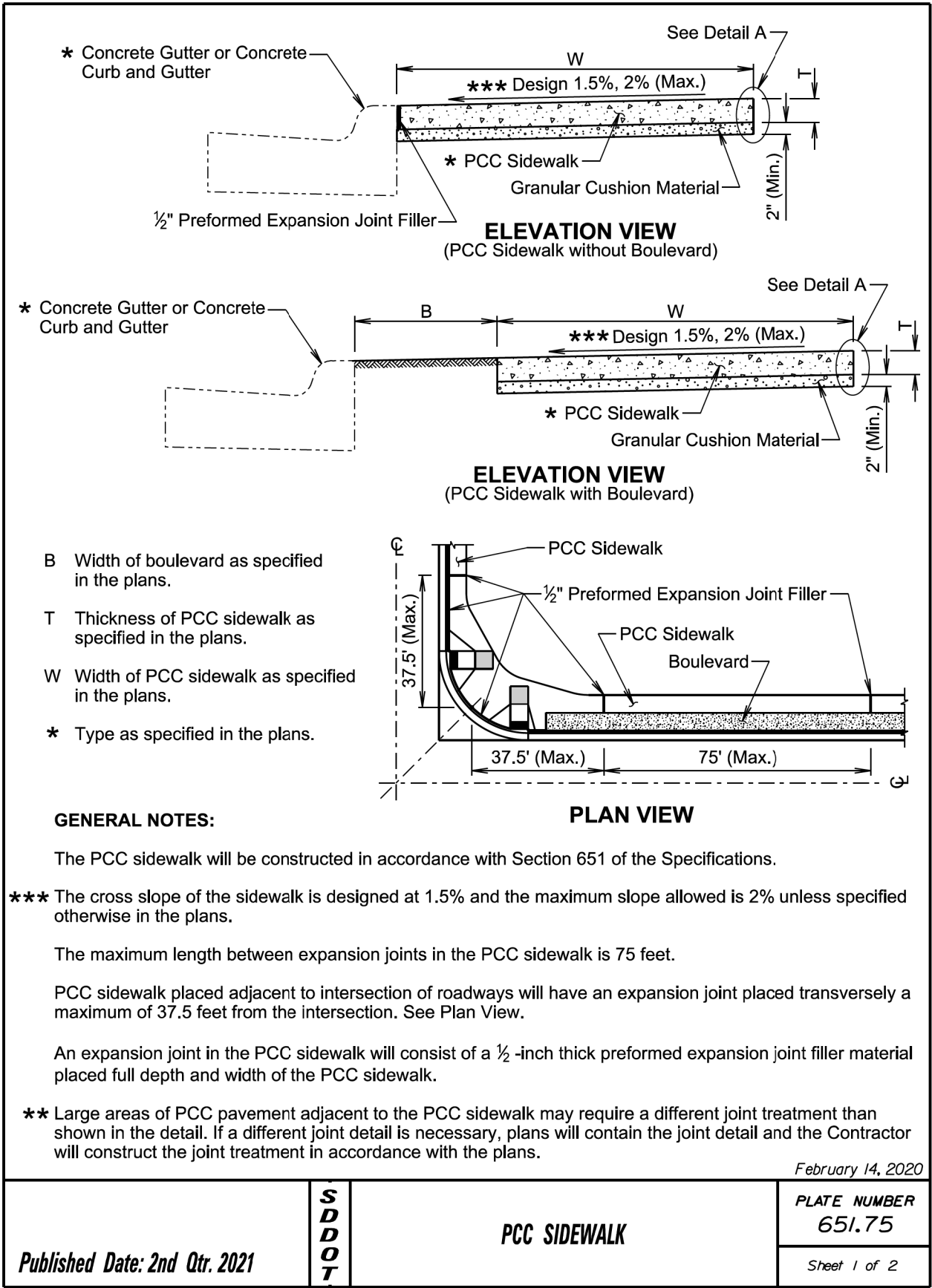


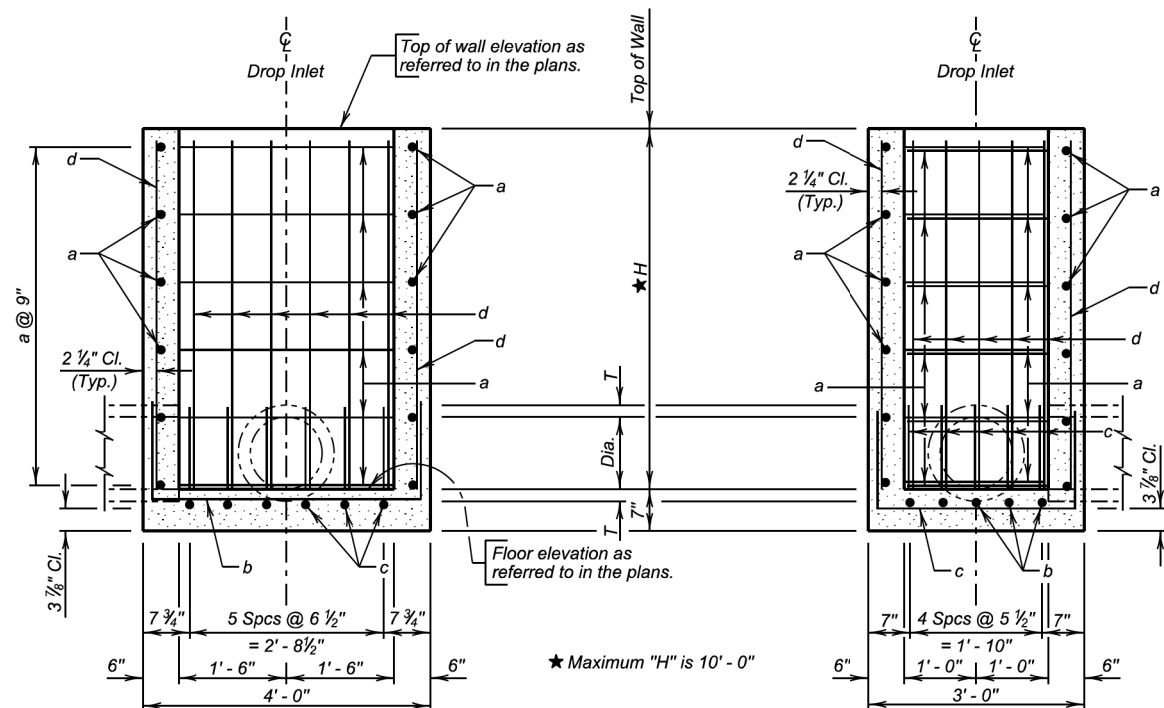
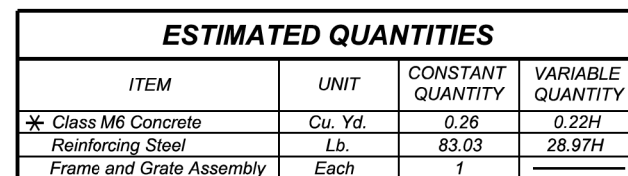
February 14, 2020

<b>S D D O T</b>	<b>REINFORCED CONCRETE SIDEWALK ADJACENT TO PRECAST CONCRETE TYPE S DROP INLET LID</b>	PLATE NUMBER 651.70
		Sheet 2 of 2

Published Date: 2nd Qtr. 2021







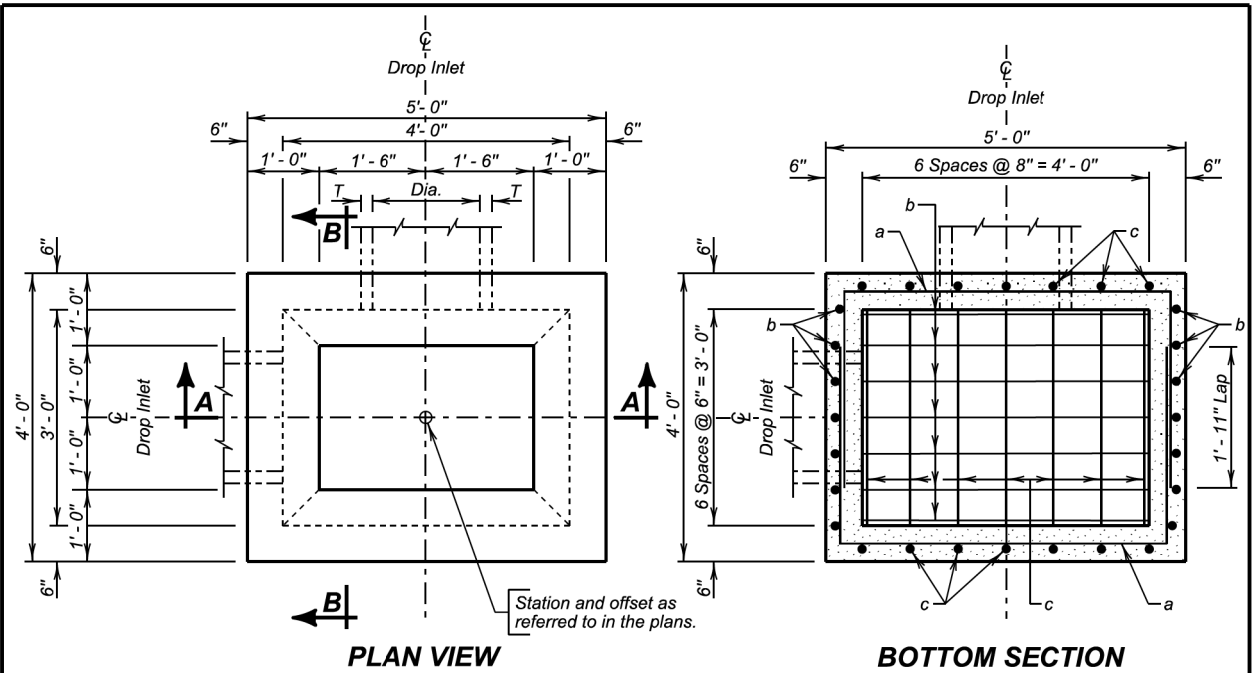
### REINFORCING SCHEDULE

Mk.	No.	Size	Length	Type
a	2.67H	4	8' - 0"	17
b	5	5	6' - 3"	17
c	6	4	5' - 3"	17
d	22	4	H - 2"	Str.

**NOTE:**  
All dimensions are out to out of bars.

Published Date: 2nd Qtr. 2021	S D D O T	2' X 3' TYPE B REINFORCED CONCRETE DROP INLET	PLATE NUMBER 670.01
			Sheet 2 of 2





ESTIMATED QUANTITIES			
ITEM	UNIT	CONSTANT QUANTITY	VARIABLE QUANTITY
★ Class M6 Concrete	Cu. Yd.	0.72	0.30H
Reinforcing Steel	Lb.	130.93	36.54H
Frame and Grate Assembly	Each	1	

DROP INLETS FOR 12" TO 36" DIAMETER PIPE

SPECIFICATIONS

Design Specifications: AASHTO LRFD Bridge Design Specifications, 2012 Edition.

Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, Current Edition and required Provisions, Supplemental Specifications, and Special Provisions as included in the Proposal.

GENERAL NOTES:

Design Live Load: HL-93. No construction loading in excess of legal load was considered.

Reinforcing steel shall conform to ASTM A615 grade 60. The d bars shall be lapped 12 inches with the b and c bars. Cut and bend reinforcing steel as required to place pipe(s) through the drop inlet wall.

Drop inlet may be precast. If precast drop inlet details differ from this standard plate, submit a checked design done by a SD registered P.E. and shop plans to the Office of Bridge Design for approval.

★ Reduce total quantities of concrete by the amount of concrete displaced by the pipe(s). The total quantity of concrete shall be computed to the nearest hundredth of a cubic yard. The total quantity of reinforcing steel shall be computed to the nearest pound.

Drop inlet shown may be modified by the addition or omission of connecting pipes as noted elsewhere in the plans. All pipes entering drop inlet must fit between the inside face of walls and shall not enter through the corners.

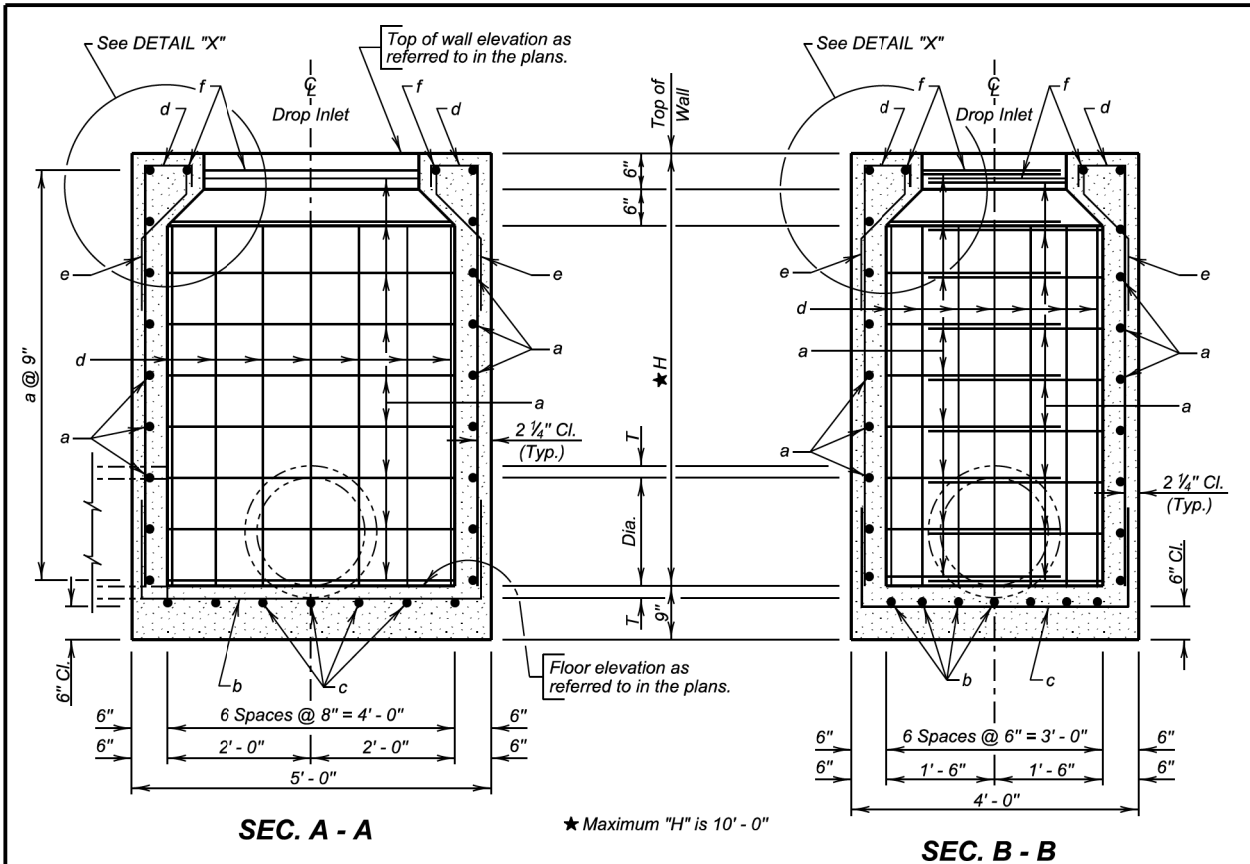
Maximum R.C.P. diameter shall not exceed 24 inches (24 inches for R. C. arch) on the 3-foot wide side and shall not exceed 36 inches (30 inches for R.C. arch) on the 4-foot wide side of the drop inlet.

The dimension of H is in feet. Maximum H is 10 feet.

PIPE DISPLACEMENT REDUCTIONS			
Diameter (Inches)	Wall T (Inches)	Class M6 Concrete (Cu. Yd.)	
12	2	0.03	
15	2 1/4	0.04	
18	2 1/2	0.05	
24	3	0.09	
30	3 1/2	0.14	
36	4	0.20	
18	2 1/2	0.05	
24	3 1/2	0.09	
30	4	0.14	

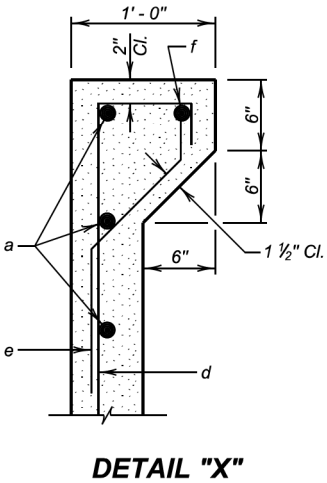
December 16, 2015

Published Date: 2nd Qtr. 2021	S D D O T	3' X 4' TYPE B REINFORCED CONCRETE DROP INLET	PLATE NUMBER 670.02
		Sheet 1 of 2	



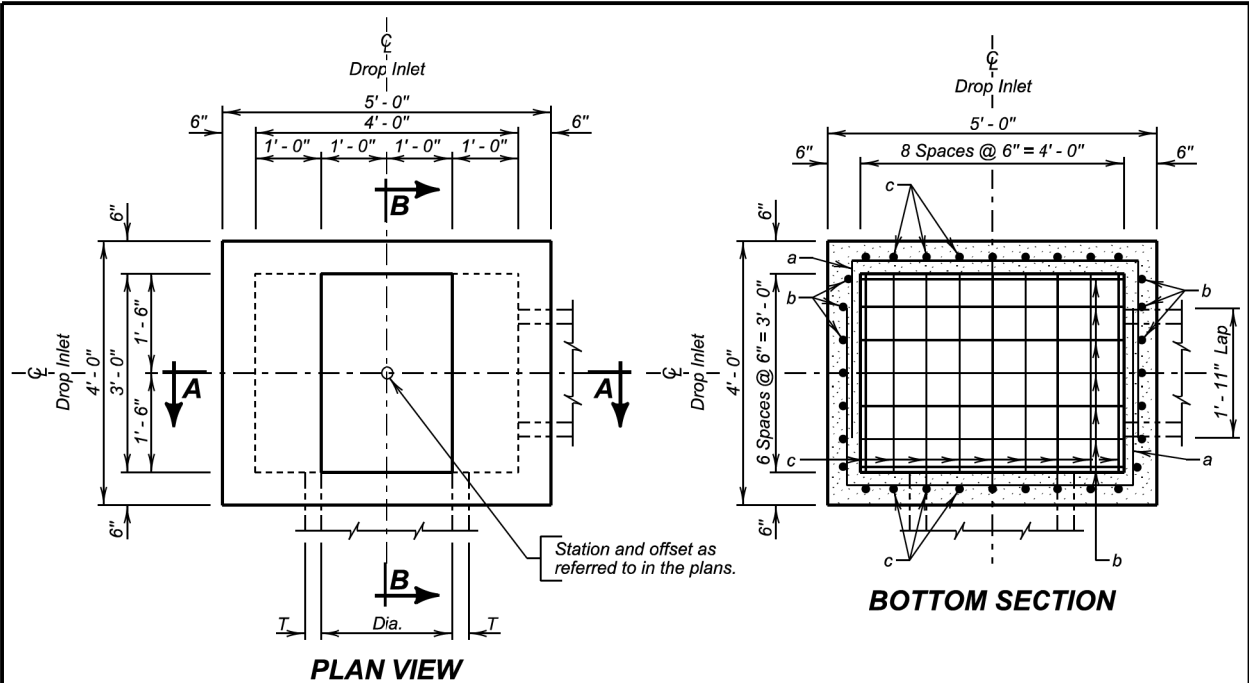
REINFORCING SCHEDULE				
Mk.	No.	Size	Length	Type
a	2.67H	4	10'-0"	17
b	7	4	7'-6"	17
c	7	4	6'-6"	17
d	28	4	H + 9"	S17
e	28	4	2'-3"	S19
f	2	4	7'-0"	17

NOTE: All dimensions are out to out of bars.



December 16, 2015

Published Date: 2nd Qtr. 2021	S D D O T	3' X 4' TYPE B REINFORCED CONCRETE DROP INLET	PLATE NUMBER 670.02
		Sheet 2 of 2	



ESTIMATED QUANTITIES			
ITEM	UNIT	CONSTANT QUANTITY	VARIABLE QUANTITY
* Class M6 Concrete	Cu. Yd.	0.58	0.33H
Reinforcing Steel	Lb.	116.24	39.21H
Frame and Grate Assembly	Each	1	

DROP INLETS FOR 12" TO 36" DIAMETER PIPE

SPECIFICATIONS

Design Specifications: AASHTO LRFD Bridge Design Specifications, 2012 Edition.  
Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, Current Edition and required Provisions, Supplemental Specifications, and Special Provisions as included in the Proposal.

GENERAL NOTES:

Design Live Load: HL-93. No construction loading in excess of legal load was considered.  
Reinforcing steel shall conform to ASTM A615 grade 60. The d and e bars shall be lapped 12 inches with the c and b bars, respectively. Cut and bend reinforcing steel as required to place pipe(s) through the drop inlet wall.  
Drop inlet may be precast. If precast drop inlet details differ from this standard plate, submit a checked design done by a SD registered P.E. and shop plans to the Office of Bridge Design for approval.  
\* Reduce total quantities of concrete by the amount of concrete displaced by the pipe(s). The total quantity of concrete shall be computed to the nearest hundredth of a cubic yard. The total quantity of reinforcing steel shall be computed to the nearest pound.  
Drop inlet shown may be modified by the addition or omission of connecting pipes as noted elsewhere in the plans. All pipes entering drop inlet must fit between the inside face of walls and shall not enter through the corners.  
Maximum R.C.P. diameter shall not exceed 36 inches (30 inches for R. C. arch) on the 4-foot wide side and shall not exceed 24 inches (24 inches for R. C. arch) on the 3-foot wide side of the drop inlet.  
The dimension of H is in feet. Maximum H is 10 feet.

PIPE DISPLACEMENT REDUCTIONS			
Diameter (Inches)	Wall T (Inches)	Class M6 Concrete (Cu. Yd.)	
12	2	0.03	
15	2 1/4	0.04	
18	2 1/2	0.05	
24	3	0.09	
30	3 1/2	0.14	
36	4	0.20	
18	2 1/2	0.05	
24	3 1/2	0.09	
30	4	0.14	

December 16, 2015

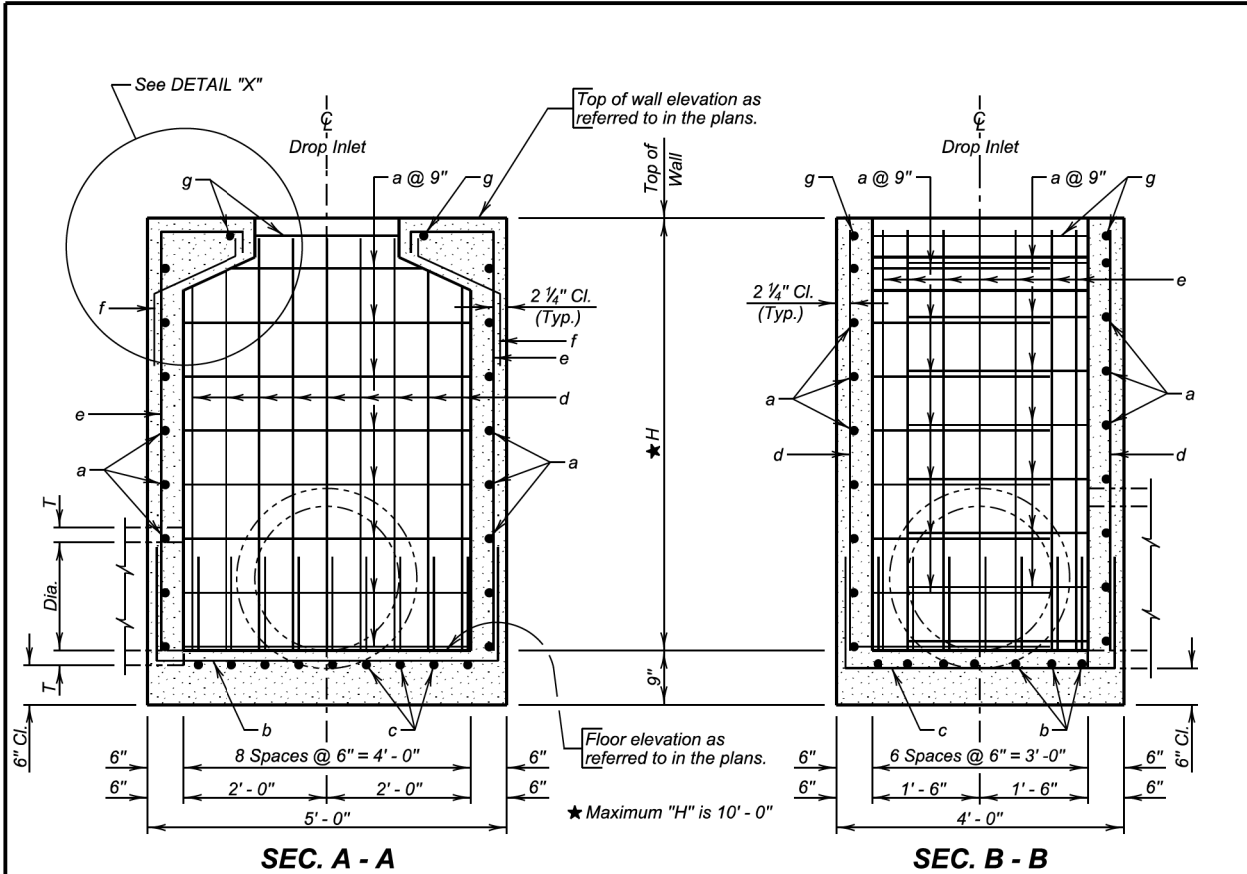
SD  
DOT

4' X 3' TYPE B  
REINFORCED CONCRETE DROP INLET

Published Date: 2nd Qtr. 2021

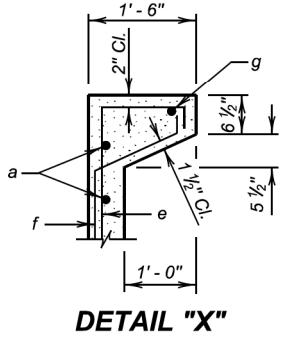
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REINFORCING SCHEDULE				
Mk.	No.	Size	Length	Type
a	2.67H	4	10' - 0"	17
b	7	4	7' - 6"	17
c	9	4	6' - 6"	17
d	18	4	H - 2"	Str.
e	14	4	H + 15"	S17
f	14	4	2' - 6"	S19
g	2	4	6' - 9"	17

NOTE:  
All dimensions are out to out of bars.



December 16, 2015

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DOT

4' X 3' TYPE B  
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