The elevations shown in these plans are based on the National Geodetic Location: Sta. 457 + 49.00 Rt. (Note: Mainline OT > 1364.1', Sta. 457 + 49.00).

NOTE: Blue header flow line has been depressed 1' - 0" below channel flow line to accommodate aquatic organisms. The 1' - 0" depression will be allowed if/when naturally over time.

**VERTICAL CURVE DATA**

- **ELEVATION**: F.L. Elev. 1348.00
- **PLANS**: Sheet No. 1 - General Drawing and Quantities
- **INDEX OF CULVERT SHEETS**
  - Sheet No. 1 - General Drawing and Quantities
  - Sheet No. 2 - Notes and Undercut Details
  - Sheet No. 3 - Standard Inlet Details
  - Sheet No. 4 - Standard Outlet Details
  - Sheet No. 5 - Standard S2 Barrel End Section Details
  - Sheet No. 6 - Standard Plate No. 620.16
  - Sheet No. 7 - Standard Plate No. 620.16

**HYDRAULIC DATA**

- **Q**: 350 cfs
- **V**: 3.4 ft
- **Cf**: 1.61 ft
- **Cm**: 0.92 ft
- **Sta. 458**: 53.00
- **Topo**: 181.00

**TABLE OF WORKING POINTS**

- **N.W.**: 416 + 49.50
- **N.S.**: 416 + 50.00
- **N.E.**: 416 + 49.50
- **E.S.**: 416 + 50.00

**ESTIMATED QUANTITIES**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>UNIT</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class A5 Concrete, Box Culvert</td>
<td>Cu. Yd.</td>
<td>230.5</td>
</tr>
<tr>
<td>Class A5 Concrete, Box Culvert Section</td>
<td>Cu. Yd.</td>
<td>230.5</td>
</tr>
<tr>
<td>Est. Rounding &amp; Universal</td>
<td>Cu. Yd.</td>
<td>230.5</td>
</tr>
<tr>
<td>Type B Drainage Fabric</td>
<td>Sq. Yd.</td>
<td>133</td>
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**SITE 2**

**GENERAL DRAWING AND QUANTITIES**

- **FOR**: 2 - 11' X 7' BOX CULVERT (C.I.P.)
- **OVER TRIB. TO TURKEY RIDGE CREEK**
- **0° SKEW**
- **SEC. 5/8-T97N-R54W**
- **NH 0018(179)402**
- **PCN 036L**
- **HL-93**

**DESIGNED BY**

- **D.K. DEG.**
- **D.K. DEG.**
- **D.K. DEG.**

**DRAWN BY**

- **D.K. DEG.**
- **D.K. DEG.**
- **D.K. DEG.**

**DATE**

- **APRIL, 2017**

**PROJ. NO.**

- **X028-**
- **X028-**
- **X028-**

**STATE**

- **S. D. DEPT. OF TRANSPORTATION**

**DESIGNATION**

- **ALTERNATE A**
- **ALTERNATE A**
- **ALTERNATE A**

**LOCATION**

- **TURNER COUNTY**
- **TURNER COUNTY**
- **TURNER COUNTY**

**NOTES**

- For estimating purposes only, a factor of 1.4 tons/cu. yd. was used to convert Cu. Yd. to Tons.

- Maximum computed outlet velocity for the proposed culvert based on 100 year frequency.

- Computed discharge for the basin approaching proposed project based on 100 year frequency.

- Design discharge for the proposed culvert based on 100 year frequency.
1. Design Live Load: HL-93 and construction load consisting of one 7'-6'' gage axle with gross axle weight = 50,000 lbs. The construction load shall not be applied in a manner of 7'-6'' gage axle lane equal to or less than 50,000 lbs. Other construction loads in series of legal load must be submitted thru proper channels to the Office of Bridge Design for approval.

1. Design of the barrel section is based on a minimum fill height of 2 feet and includes all subsequent fill heights up to and including the maximum fill height of 10 ft. (S2).

2. The design of the barrel section is based on a minimum fill height of 2 feet and includes all subsequent fill heights up to and including the maximum fill height of 10 ft. (S2).

3. Design Material Strengths: Concrete f'c = 4500 psi.

4. All reinforcing steel shall conform to ASTM A615 Grade 60.

5. All concrete shall be Class A45 conforming to Section 4G0.

6. All exposed edges shall be chamfered 1/2 inch.

7. Use 1 inch clear cover on all reinforcing steel EXCEPT as shown.

8. The Contractor shall imprint on the structure the date of construction as specified and detailed on Standard Plate No. 460.02.

9. Care shall be taken to establish Working Points (W.P.) as shown on the wing.


11. The design of the barrel section is based on a minimum fill height of 2 feet and includes all subsequent fill heights up to and including the maximum fill height of 10 ft. (S2).

12. Dimension "L" on the standard box culvert sheet(s) is the barrel section length shown in the PLAN view on the General Drawing (for each S2 barrel section, as applicable).

13. Care shall be taken to establish Working Points (W.P.) as shown on the wing.

14. Dewatering will be required to construct the box culvert.

NOTES AND UNDERCUT DETAILS

1. Design Live Load: HL-93 and construction load consisting of one 7'-6'' gage axle with gross axle weight = 50,000 lbs. The construction load shall not be applied in a manner of 7'-6'' gage axle lane equal to or less than 50,000 lbs. Other construction loads in series of legal load must be submitted thru proper channels to the Office of Bridge Design for approval.

1. Design of the barrel section is based on a minimum fill height of 2 feet and includes all subsequent fill heights up to and including the maximum fill height of 10 ft. (S2).

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3. Design Material Strengths: Concrete f'c = 4500 psi.

4. All reinforcing steel shall conform to ASTM A615 Grade 60.

5. All concrete shall be Class A45 conforming to Section 4G0.

6. All exposed edges shall be chamfered 1/2 inch.

7. Use 1 inch clear cover on all reinforcing steel EXCEPT as shown.

8. The Contractor shall imprint on the structure the date of construction as specified and detailed on Standard Plate No. 460.02.

9. Care shall be taken to establish Working Points (W.P.) as shown on the wing.


11. The design of the barrel section is based on a minimum fill height of 2 feet and includes all subsequent fill heights up to and including the maximum fill height of 10 ft. (S2).

12. Dimension "L" on the standard box culvert sheet(s) is the barrel section length shown in the PLAN view on the General Drawing (for each S2 barrel section, as applicable).

13. Care shall be taken to establish Working Points (W.P.) as shown on the wing.

14. Dewatering will be required to construct the box culvert.

ESTIMATED QUANTITIES

<table>
<thead>
<tr>
<th>ITEM</th>
<th>UNIT</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Box Culvert Undrfill</td>
<td>Cu. Yd.</td>
<td>287</td>
</tr>
</tbody>
</table>

The payment, quantity is based on plan shown undercut dimensions and will not be measured unless the Engineer orders a change.

SITE 2

ALTERNATE A

FOR

2 - 11' X 7' BOX CULVERT (C.I.P.)

OVER TRIB. TO TURKEY RIDGE CREEK 0° SKEW
STA. 456 + 35.00
SEC. 56-T97N-R54W
NH 0018(179)402
HL-93

TURNER COUNTY
S. D. DEPT. OF TRANSPORTATION
APRIL 2017

DESIGNED BY
DK DESIGNED BY
GRAFTED BY

1 2 3 4 5 6 7
REQUIRED LIST

1. Title Block  
2. Project Block  
3. Reinforcing Schedule  
4. Estimated Quantities  
5. Sections as Req'd.  
6. Legend

LEGEND FOR PLACING RE-STEEL

1. F. W. W. - Outside Face of Wing Wall  
2. I. W. W. - Inside Face of Wing Wall

REINFORCING SCHEDULE

<table>
<thead>
<tr>
<th>Item</th>
<th>Dia.</th>
<th>Length</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

ESTIMATED QUANTITIES

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<thead>
<tr>
<th>Item</th>
<th>Concrete, P.C. Type</th>
<th>Reinforcing Steel Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SITE 2 ALTERNATE A

STANDARD OUTLET DETAILS

FOR

2 - 11" X 7" BOX CULVERT

0° SKEW

TURNER COUNTY

S. D. DEPT. OF TRANSPORTATION

APRIL 2017

DESIGNED BY

DK. DES. BY

GRAFTED BY

8 OF 7
YEAR PLATE DETAILS

GENERAL NOTES:

1. Year plate of the general dimensions shown shall be constructed on all box culverts and bridges. The year plate shall be constructed to measure and attached to the forms in such a manner that the finished imprint in the concrete does not exceed one-half (1/2") inch in depth.

2. Year plates shall be located on structure (s) as follows:

a. On cast-in-place box culverts the year plate shall be four and one-half (4 1/2") inches below the top of the upstream parapet wall and centered laterally on the upstream face. On prestressed box culverts the year plate shall be centered laterally on the upstream face of the top slab. Where an extended interior wall interferes with the location, the year plate shall be centered in an adjacent barrel.

b. On bridges with six (6) inch curbs or "Jenrey" shaped barriers with no embankments, the year plate shall be centered vertically on the curb face approximately six (6) inches from the end of the bridge, or as designated by the Engineer. On bridges with "Jenrey" shaped barrier embankments, the year plate shall be centered on the upper slope portion of the barrier approximately 3'-6" from the end of the bridge, or as designated by the Engineer. There shall be one year plate at each end of the bridge on opposite sides.

c. When the plans specify that both the original state of construction and the date of reconstruction are to be shown, one date plate shall be placed as labeled above and the aforementioned adjacent to. Both year plates shall be shown at each end of the bridge on opposite sides.

3. There shall be no separate measurement or payment made for year plates on box culverts and bridges. All costs for this work shall be incidental to other contract items.

JERSEY BARRIER
(With Embankment)

JERSEY BARRIER

TYPE B CURB

June 26, 2018

Published Date: 1st Qtr, 2018

YEAR PLATE DETAILS

PLATE NUMBER 460.02

Sheet 1 OF 1

PROJECT NO.

SHEETS

TOTAL

STATE

OF

APRIL 2017

P. 12

2 - 11' X 7' BOX CULVERT (C.I.P.)

Published Date: 1st Qtr, 2018

BOX CULVERT B ARREL REINFORCEMENT

PLATE NUMBER 460.10

Sheet 1 OF 1

1

ALTERNATE A

S T I M E 2

REQUIRED LIST

1. Title Block
2. Insert Required Standard Plate Sheets as Needed

- 2 -
GENERAL NOTES:
1. The fence and post details shown are for illustrative purpose only. The fence shall be as specified elsewhere in the plans.
2. Eyebolts shall be placed on all of the box culvert wing walls.
3. Eyebolts shall be 9/16 inch diameter and shall conform to ASTM A307.
4. Eyebolts, nuts, and concrete inserts shall be galvanized in accordance with AASHTO M222 (ASTM A153). Concrete inserts of corrosion resistant material need not be galvanized.
5. Cast-in-place eyebolts shall have a nut attached, be 4 ½ inches (min.) in length and shall be embedded such that the eye of the bolt is flush with the concrete surface. (See Eyebolt Details) As an alternate, cast-in-place concrete inserts, capable of developing the full strength of the 9/16 inch or larger eyebolts are to be used. All concrete inserts shall be installed in accordance with the manufacturer’s recommendations. The eyebolt shall be of sufficient length to develop its full strength. The eye of the eyebolt shall be flush with the concrete surface.
6. The cost for furnishing and installing eyebolts and/or concrete inserts shall be included in various contract items.

FENCE ANCHORS FOR BOX CULVERT WING WALLS

December 23, 2018

Published Date: 1st Qtr. 2018

SITE 2
ALTERNATE A

2 - 11' X 7' BOX CULVERT (C.I.P.)

STRI. NO. 63-074-180
APRIL 2017

REQUIRED LIST
1. Title Block
2. Insert Required Standard Plate Sheets as Needed
3. Project Block
SITE 2  
ALTERNATE B

GENERAL DRAWING AND QUANTITIES

FOR

2 - 12' X 7' BOX CULVERT (PRECAST)

OVER TRIB. TO TURKEY RIDGE CREEK  
0° SKEW

STA. 456 + 35.00

SEC. 5/8-T97N-R54W
NH 0018(179)402

PCN 036L

CTB ELEV. 1363.50 (Subgrade)

NOTE: The box culvert flow line has been depressed 1' - 0'' below channel flow line to accommodate aquatic organisms. The 1' - 0'' depression will be allowed to fill in naturally over time.
### Specifications


#### General Notes

2. Design Live Load: HL-93 and construction loading consisting of one 7'-6" gage axle with gross weight = 95,850 lbs. The construction load shall be applied until a minimum of 4 ft. of fill has been placed over the Box Culvert. If construction loads in excess of legal load are anticipated by the Contractor, the Contractor shall submit to the Office of the Bridge Design Engineer shop plans, as appropriate.
3. The box culvert shall be load rated in accordance with the AASHTO Manual for Bridge Evaluation, 2015 Edition with latest Interim Revisions using the LRFD method. The rating shall include evaluation of the Design HL-93 Truck at both legal and over the box culvert, and the legal load rating shall be based on the demand and loading expected in the design life of the box culvert. The structure shall be evaluated for the maximum fill height of 10 ft. or less in the directions of travel, the underground storm sewer line, the railroad right of way, and the bridge ultimate factored load. The design of the barrel sections shall be based on a minimum fill height of 2 feet and include all subsequent fill heights up to and including the maximum fill height of 10 ft. or less in the directions of travel.

#### Design Mix of Concrete Precast Portions

1. Mix shall be per fabricator's design; however, minimum compressive strength shall not be less than 4500 psi at 28 days.
2. Type II cement is required.

#### Shop Plans

The fabricator shall submit shop plans in accordance with the specifications, including design and shop design, if applicable, with original submittals.

### Estimated Quantities

**SITE 2**

**ALTERNATE B**

**FOR**

2 - 12' X 7' BOX CULVERT (PRECAST)

OVER TRIB. TO TURKEY RIDGE CREEK

6° SKEW

STA. 456 + 35.00

SEC: 5/8-T97N-R54W

NH 0018(179)402

TURNER COUNTY

S. D. DEPT. OF TRANSPORTATION

APRIL 2017

**CH**

**Notes and Undercut Details**

For payment, quantity is based on plans shown and actual dimensions and shall not be measured unless the Engineer orders a change.
YEAR PLATE DETAILS

GENERAL NOTES:
1. Year plates of the general dimensions shown shall be constructed on all box culverts and bridges. The year plates shall be constructed in reverse and affixed to the forms in such a manner that the finished imprint in the concrete does not exceed one-half (1/2") inch in depth.
2. Year plates shall be located on structure(s) as follows:
   a. On cast-in-place box culverts the year plates shall be four and one-half (4 1/2") inches below the top of the upstream parapet wall and centered laterally on the upstream face. On precast box culverts the year plates shall be centered laterally on the upstream face of the top slab. Where an extended exterior wall intersects with the location, the year plate shall be centered in an adjacent tunnel.
   b. On bridges with six (6) inch culverts or "Jersey" shaped barriers with no embankment, the year plate shall be centered vertically on the curb face approximately 3' feet from the end of the bridge, or as designated by the Engineer. On bridges with "Jersey" shaped barrier embankments, the year plate shall be centered on the upper step of the barrier approximately 5'-6" from the end of the bridge, or as designated by the Engineer. There shall be one year plate at each end of the bridge on opposite sides.
   c. When the spaces specify that both the original date of construction and the date of reconstruction are to be shown, one date plate shall be placed as listed above and the other denoting the location. Both year plates shall be shown at each end of the bridge on opposite sides.
3. There will be no separate measurement or payment made for year plates on box culverts and bridges. All costs for this work shall be incidental to other contract items.

TIE BOLT ASSEMBLY

GENERAL NOTES:
1. All bolts for the bolts shall be cast-in-place, 1/2" inches from opposite edge of form. Cast in center line, if possible. Cast in center line, if possible.
2. Ties shall be 1" diameter and conform to the requirements of ASTM A36, ASTM A572, or ASTM F1664, Gr. 36. Note shall be heavy duty in conformance with ASTM A643. Washers shall conform to ASTM F436, Class B. The welded pipe sleeve shall conform to ASTM A106, Grade B.
3. Welding and casting inspection shall be in accordance with AWS/ASAE D1.1. (Current Year) Structural Welding Code: Steel.
4. Tie Bolt Assembly shall be galvanized in accordance with ASTM A153 or ASTM F2239 as applicable.
5. Tie Bolt Assembly details may vary from those shown, but alternate tie bolt assemblies are subject to being in accordance with the design and shall be pre-stressed through proper channels, to the Office of Bridge Design for approval.
6. All costs for furnishing and installing the precast box culvert tie bolt assembly shall be included in the contract unit price per Foot for "Precast Concrete Box Culvert, Fusedite".

Published Date: 1st Qtr. 2018

Published Date: 1st Qtr. 2018

REQUIRED LIST
1. Title Block
2. Insert Required Standard Plate Sheets as Needed
3. Project Block

SITE 2
ALTERNATE B

2 - 12' X 7' BOX CULVERT (PRECAST)

STR. NO. 63-074-180
APRIL 2017

OF 4
CUTOFF WALL

1. All costs associated with furnishing and installing the Cutoff Wall, whether precut or in-place, shall be included in the contract unit price per each for "Precast Box Culvert End Section, Furnished".
2. Concrete for cast-in-place cutoff wall shall be Class H concrete in accordance with Section 402 of the Specifications.
3. All reinforcing steel shall conform to ASTM A615 Grade 60.
4. Alternate details will be allowed, subject to the approval of the Bridge Construction Engineer.

DETAIL "K"

NOTES: Joint details may vary from those shown according to the manufacturer's design. Submit details with shop plans for approval.

ELEVATION

match Hole on Cut-off Wall

SEC. C - C

LEGEND

W = Width

H = Height

T1 = Thickness of Top Slab

T2 = Thickness of Cut-off Wall

Tm = Thickness of Middle Wall

L = Length of End Section

NOTES:

1. See GENERAL DRAWING for W and H dimensions.
2. T1, T2, Tm, L, and Td dimensions shall be furnished by the Contractor.
3. Length and number of units may vary from that shown.

VIEW A - A

December 23, 2016

GENERAL NOTES:

1. The fence and post details shown are for illustrative purpose only. The fence shall be as specified elsewhere in the plans.
2. Eyebolts shall be placed on all of the box culvert wing walls.
3. Eyebolts shall be 6 inch diameter and shall conform to ASTM A307.
4. Eyebolts, nuts, and concrete inserts shall be galvanized in accordance with ASTM A153.
5. Concrete inserts of corrosion resistant material will not be galvanized.
6. Cast-in-place eyebolts shall have a nut attached, the 0.5 inch (16mm) in length and shall be embedded such that the eye of the bolt is flush with the concrete surface. (See Eyebolt Detail A). An alternative may be the use of a plate concrete inserts, capable of developing the full strength of the 0.5 inch (16mm) nut to be used in lieu of the eyebolts. The plate concrete inserts shall be furnished in accordance with the manufacturer's recommendations. The eye of the eyebolt shall be sufficient length to develop its full strength. The eye of the eyebolt shall be flush with the concrete surface.
7. The cost for furnishing and installing eyebolts and concrete inserts shall be included in various contract items.

SITE 2

ALTERNATE B

2 - 12' X 7' BOX CULVERT (PRECAST)

Published Date: 1st Qtr. 2018

REQUIRED LIST

1. Title Block
2. Insert Required Standard Flate Sheets as needed
3. Project Block

Published Date: 1st Qtr. 2018

Sheet 1 of 1

620.16

Sheet 1 of 1
SPECIFICATIONS


GENERAL NOTES

1. Design Live Load: HL-93 and construction load consisting of one 7'-6" gage axle with gross axle weight = 99,000 lbs. The construction load shall not be applied unless a minimum of 4 feet of fill has been placed over the Box Culvert. Other construction loads in excess of legal load must be submitted to the Engineer for approval.
2. The design of the box culvert is based on a minimum fill height of 3 feet and includes a subsequent 5 feet of fill to include the maximum fill height of 8 feet.
3. Design Material Strengths: Concrete f’c = 4500 psi, Reinforcing Steel f = 50000 psi.
4. High-sulfate areas are likely to be encountered on this project. All concrete shall be Grade H for high-sulfate areas. All reinforcing steel shall be Grade 60.
5. All reinforcing steel shall conform to ASTM A615 Grade 65.
6. All exposed edges shall be chertoned 3 inch.
7. Use 1 inch clear cover over all reinforcing steel EXCEPT as shown.
8. The Contractor shall support the structure of the steel section as specified and detailed on Standard Plate No. 460.22.
9. Cords shall be locked to resist wind forces.
10. Circled numbers in PLAN and ELEVATION views on the General Drawing are thread used shall be high strength polypropylene, polyester, or Kevlar thread. Nylon threads will not be allowed.
11. Compaction of earth embankment and box culvert backfill material shall be governed by the Specified Density method.
12. The subsurface soils at Station 636 + 96 - 33' Lt. consist of gray silt-clay with groundwater elevation at 1283.9.
13. Dewatering will be required to construct the box culvert.
14. No equipment is to be allowed on the geotextile until the granular material is in place.
16. The geotextile will conform to specification for Geotextiles and Geosynthetic Materials.
17. The geotextile will be paid for at the contract unit price per sq. yd. for Reinforcement Fabric (MSE).
18. The geotextile will be paid for at the contract unit price per cubic yard for Box Culvert Undercut.
19. All reinforcing steel shall be grade 65.
20. All reinforcing steel shall conform to ASTM A615 Grade 65.
21. The geotextile will conform to specification for Geotextiles and Geosynthetic Materials.
22. The geotextile will be paid for at the contract unit price per sq. yd. for Reinforcement Fabric (MSE).

INSTALLATION PROCEDURE - GEO TEXTILE

1. The geotextile will conform to specification for Geotextiles and Geosynthetic Materials.
2. The geotextile will be paid for at the contract unit price per sq. yd. for Reinforcement Fabric (MSE).
3. The geotextile will be paid for at the contract unit price per cubic yard for Box Culvert Undercut.
4. All seams in the geotextile will be stitched in accordance with the seaming procedure notes and as shown on the details labeled "Seam Types".
5. No equipment is to be allowed on the geotextile until the granular material is in place.
6. The geotextile should be kept wet as possible prior to backfilling.
7. Granular material will be placed behind the leading edge of the MSE and pushed into place with a caterer or dozer.

SEAMING PROCEDURE

1. The seams shall consist of two parallel rows of stitching — "prayer" seam, Type SSa-2, or shall consist of a "J" seam, Type SSn-1, using a single row of stitching. This stitching shall be size 550 thread.
2. If the 550 thread is used, the two rows of stitching shall be 1" apart with a tolerance of plus or minus 3/8", and shall not cross, except for reinforcing. The minimum seam allowance, i.e., the minimum distance from the geotextile edge to the stitch line nearest to the edge, shall be 1.5".
3. If the J seam, Type SSn-1, is used, the minimum seam allowance shall be .25".
4. The seams, when used, shall be located as shown. The stitching shall be performed by the manufacturer of the geotextile and approved by the Engineer.
5. The seams shall be sewn in such a manner that the seams can be readily inspected by the Engineer.
6. Thread used shall be high strength polypropylene, polyester, or Kevlar thread. Nylon threads will not be allowed.

REQUERED LIST

1. Title Block
2. Undercut and Backfill
3. Project Block
4. Estimated Quantities
5. Plan Notes
6. North Arrow

NOTES AND UNDERCUT DETAILS

FOR

2 - 12' X 5' BOX CULVERT

OVER TRIB. TO TURKEY RIDGE CREEK 39° LHF SKEW

STRAIGHT RUN = 95.00
SEC. 63-109-160
STR. NO. 30'-9''

NOTES:

1. For payment, quantity is based on plans shown undercut dimensions and will not be measured unless the Engineer orders a change.

TOTAL: 3 SHEETS

NH 0018(179)402
S.D. DEPT. OF TRANSPORTATION
TURNER COUNTY
DESIGNED BY
JUNE 2017
DRAFTED BY
PLAN

OPTIONAL FILLET DETAIL
(At Bottom Slab)

NOTE:
Contractor may form the optional full fillet, 2" Chamfer, as detailed. The cost of the additional concrete shall be borne by the Contractor.

OPTIONAL POUR - BOTTOM SLAB

The Bottom Slab may be poured continuously, at the option of the Contractor, with the use of a Preformed Metal keyway con- forming to the keyway dimensions and location as shown on the plans. The keyway length shall be full width of the bottom slab. Care shall be taken to ensure proper alignment of the keyway during the pour sequence. All additional costs of the keyway shall be borne by the Contractor.

Place 2" X 3" spacers between barrel sections as shown on Standard Plate No. 460.10. Quantity of 2" bars are for one construction joint.

REINFORCING SCHEDULE

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<thead>
<tr>
<th>ITEM</th>
<th>Class 400 Concrete</th>
<th>Reinforcing Steel</th>
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<td>Cu Yd.</td>
<td>Cu Yd.</td>
<td>Cu Yd.</td>
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<td>1</td>
<td>1</td>
<td>1</td>
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</table>

FS BARREL END SECTION DETAILS (48' - 0'')

FOR

- 2 - 12' X 5' BOX CULVERT
- OVER TRIB TO TURKEY RIDGE CREEK
- STA. 636 + 95.00
- SEC. 2/11-T97N-R54W
- STR. NO. 63-109-180

TURNER COUNTY
S. D. DEPT. OF TRANSPORTATION
JUNE 2017

DESIGNED BY
Dh DES. BY
DRAWN BY

STATE
PROJECT
SHEET
TOTAL
6
9
10
YEAR PLATE DETAILS

GENERAL NOTES:
1. Year plates of the general dimensions shown shall be constructed on all box culverts and bridges. The year plates shall be constructed to measure and shall be added to the forms in such a manner that the finished imprint in the concrete does not exceed one-half (1/2") in height.

2. Year plates shall be located on structure (s) as follows:
   a. On cast-in-place box culverts the year plates shall be four and one-half (4 1/2) inches below the top of the upstream parapet wall and centered laterally on the upstream face. On precast box culverts the year plates shall be centered laterally on the upstream face of the top slab. Where an extended interior wall intersects with the location, the year plate shall be centered in the adjacent barrel.
   b. On bridges with six (6) inch curbs or “Jersey” shaped barriers with no embankments, the year plate shall be centered vertically on the curb face approximately six (6) inches from the end of the bridge, or as designated by the Engineer. On bridges with “Jersey” shaped barrier embankments, the year plate shall be centered on the upper stepped portion of the barrier approximately one (1") to two (2") from the end of the bridge, or as designated by the Engineer. There shall be one year plate at each end of the bridge on opposite sides.
   c. When the plans specify that both the original state of construction and the date of reconstruction are to be shown, one date shall be placed as listed above and the other specified adjacent to it. Both year plates shall be shown at each end of the bridge on opposite sides.

3. There shall be no separate measurement or payment made for year plates on box culverts and bridges. All costs for this work shall be incidental to other contract items.

LEGEND FOR PLACING RE-STEEL

1. "Re" bars shall be placed in the middle of the 2’ X 3’ keyway in the top and bottom slab. "P" bars shall be tapped with the longitudinal plates in the inside face of the wall for outside walls and in either face for interior walls. "P" bars are sized and included elsewhere in plans.

2. Damage Fabric Protection shall be placed in accordance with Section 422 or Section 350, whichever is applicable.

June 26, 2018

Published Date: 1st Qtr. 2018

BOX CULVERT BARREL TIE REINFORCEMENT

PLATE NUMBER
460.10

Sheet 1 Of 1

REQUIRED LIST:
1. Tie Block
2. Project Block

2 - 12’ X 5’ BOX CULVERT

STR. NO. 63-109-180
JUNE 2017

June 26, 2018

Published Date: 1st Qtr. 2018

JERSEY BARRIER

(With Drains)

JERSEY BARRIER

TYPE 6 CURB

June 26, 2018

Published Date: 1st Qtr. 2018

YEAR PLATE DETAILS

PLATE NUMBER
460.02

Sheet 1 Of 1
GENERAL NOTES:

1. The fence and post details shown are for illustrative purposes only. The fence shall be as specified elsewhere in the plans.

2. Eyebolts shall be placed on all of the box culvert wing walls.

3. Eyebolts shall be 3/4 inch diameter and shall conform to ASTM A307.

4. Eyebolts, nuts, and concrete inserts shall be galvanized in accordance with AASHTO M222 (ASTM A53). Concrete inserts of corrosion resistant material need not be galvanized.

5. Cast-in-place eyebolts shall have a nut attached, be 4 3/4 inches (Min.) in length and shall be embedded such that the eye of the bolt is flush with the concrete surface. See Eyebolt Details. As an alternate, cast-in-place concrete inserts, capable of developing the full strength of the 3/4 inch diameter eyebolt, shall be used. The concrete shall be a minimum strength of 3000 psi, as specified in accordance with the manufacturer’s recommendations. The eyebolt shall be of sufficient length to develop its full strength. The eye of the eyebolt shall be flush with the concrete surface.

6. The cost for furnishing and installing eyebolts and/or concrete inserts shall be included in various contract items.