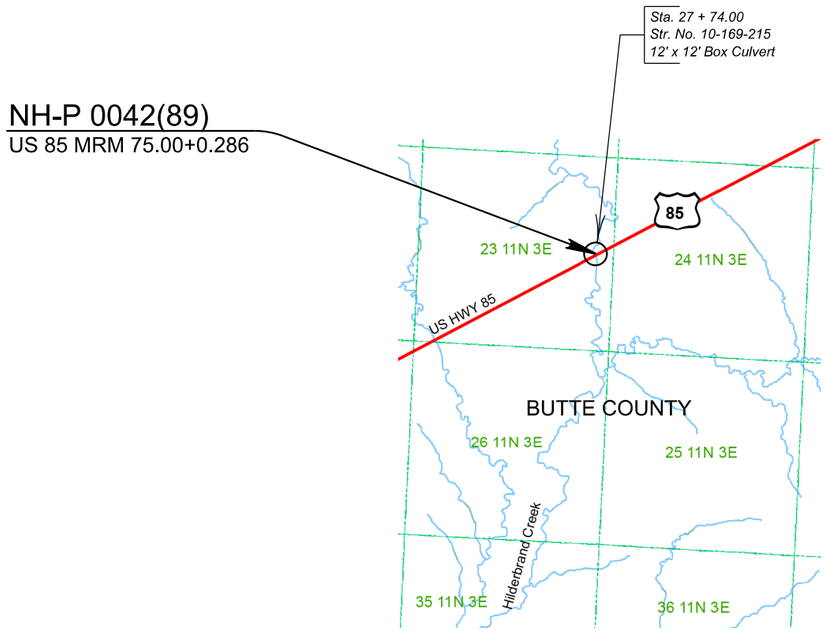
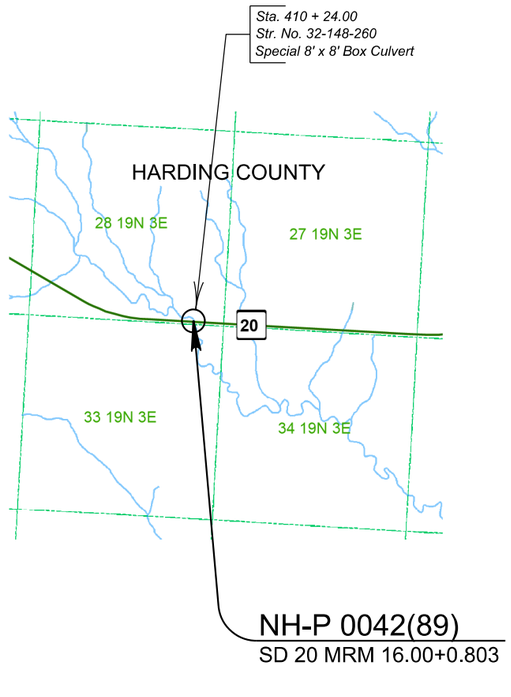
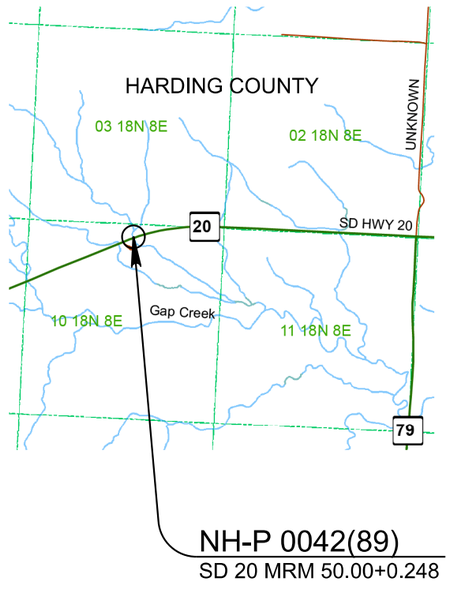
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	NH-P 0042(89)	E1	E10

Section E: Structure Plans

INDEX OF SHEETS -







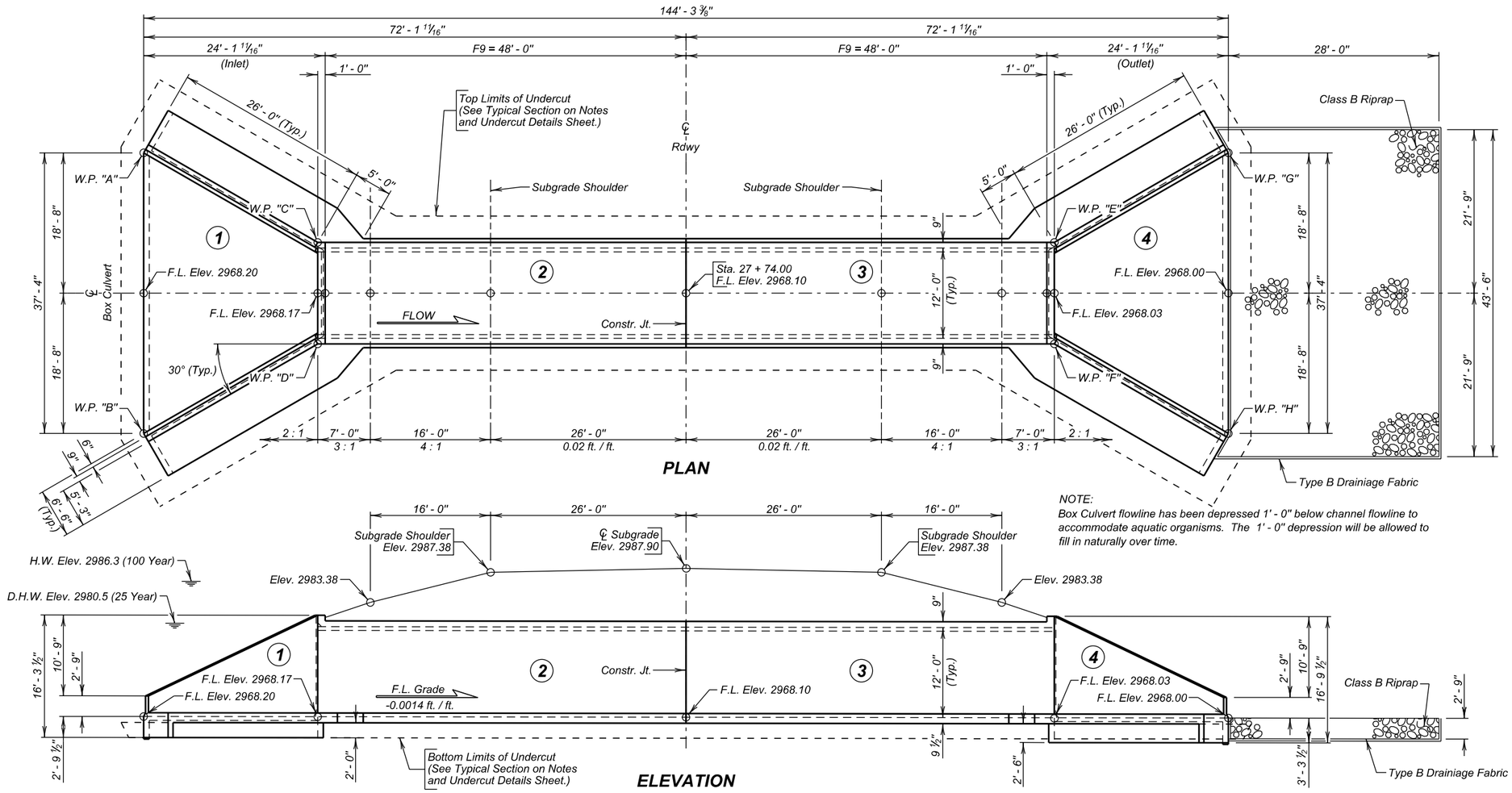
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	NH-P 0042(89)	E2	E10

SECTION E – ESTIMATE OF STRUCTURE QUANTITES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
420E0200	Structure Excavation, Box Culvert	110	CuYd
421E0200	Box Culvert Undercut	318	CuYd
460E0120	Class A45 Concrete, Box Culvert	250.6	CuYd
460E0300	Breakout Structural Concrete	10.4	CuYd
480E0100	Reinforcing Steel	41,640	Lb
700E0210	Class B Riprap	174.5	Ton
831E0110	Type B Drainage Fabric	181	SqYd

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-P 0042(89)	E3	E10



PLAN

NOTE:
Box Culvert flowline has been depressed 1' - 0" below channel flowline to accommodate aquatic organisms. The 1' - 0" depression will be allowed to fill in naturally over time.

ELEVATION

TABLE OF WORKING POINTS

W. P.	STATION	OFFSET
"A"	27 + 92.67	72.14' Lt.
"B"	27 + 55.33	72.14' Lt.
"C"	27 + 80.75	49.00' Lt.
"D"	27 + 67.25	49.00' Lt.
"E"	27 + 80.75	49.00' Rt.
"F"	27 + 67.25	49.00' Rt.
"G"	27 + 92.67	72.14' Rt.
"H"	27 + 55.33	72.14' Rt.

INDEX OF CULVERT SHEETS -

HYDRAULIC DATA

Q_d	1227 cfs
A_d	94 sq ft
V_d	13.0 fps
Q_F	1227 cfs
Q_{100}	2199 cfs
Q_{OT}	$>Q_{100}$
V_{max}	18.1 fps

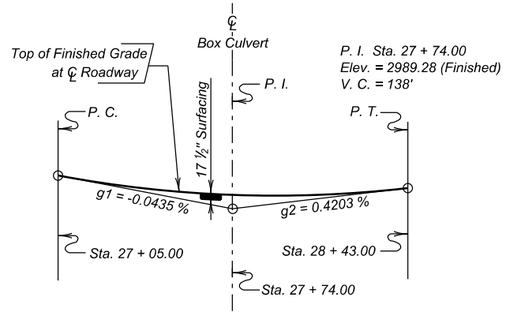
Q_d = Design discharge for the proposed culvert based on 25 year frequency. El. 2980.5.

Q_{OT} = Overtopping discharge and frequency > Q_{100} year recurrence interval. El. 2989.3 @ Sta. 27 + 18.00.

Q_F = Designated peak discharge for the basin approaching proposed project based on 25 year frequency.

Q_{100} = Computed discharge for the basin approaching proposed project based on 100 year frequency. El. 2986.3.

V_{max} = Maximum computed outlet velocity for the proposed culvert, based on 100 year frequency.



VERTICAL CURVE DATA

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY
Class A45 Concrete, Box Culvert	Cu. Yd.	240.2
Reinforcing Steel	Lb.	40848
Structure Excavation, Box Culvert	Cu. Yd.	99
Box Culvert Undercut	Cu. Yd.	318
Class B Riprap	Ton	174.5
Type B Drainage Fabric	Sq. Yd.	181

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

GENERAL DRAWING AND QUANTITIES

FOR

12' X 12' BOX CULVERT

OVER HILDERBRAND CREEK — 0° SKEW
STA. 27 + 74.00 — SEC. 23-T11N-R3E
STR. NO. 10-169-215 — NH-P 0042(89)
PCN 07NU — HL-93

BUTTE COUNTY

S. D. DEPT. OF TRANSPORTATION

JULY 2024

1 OF 7

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

DESIGNED BY	CK. DES. BY	DRAFTED BY	
BR	ER	BT	Steve A Johnson BRIDGE ENGINEER
BUTE07NU	07NUGA01		

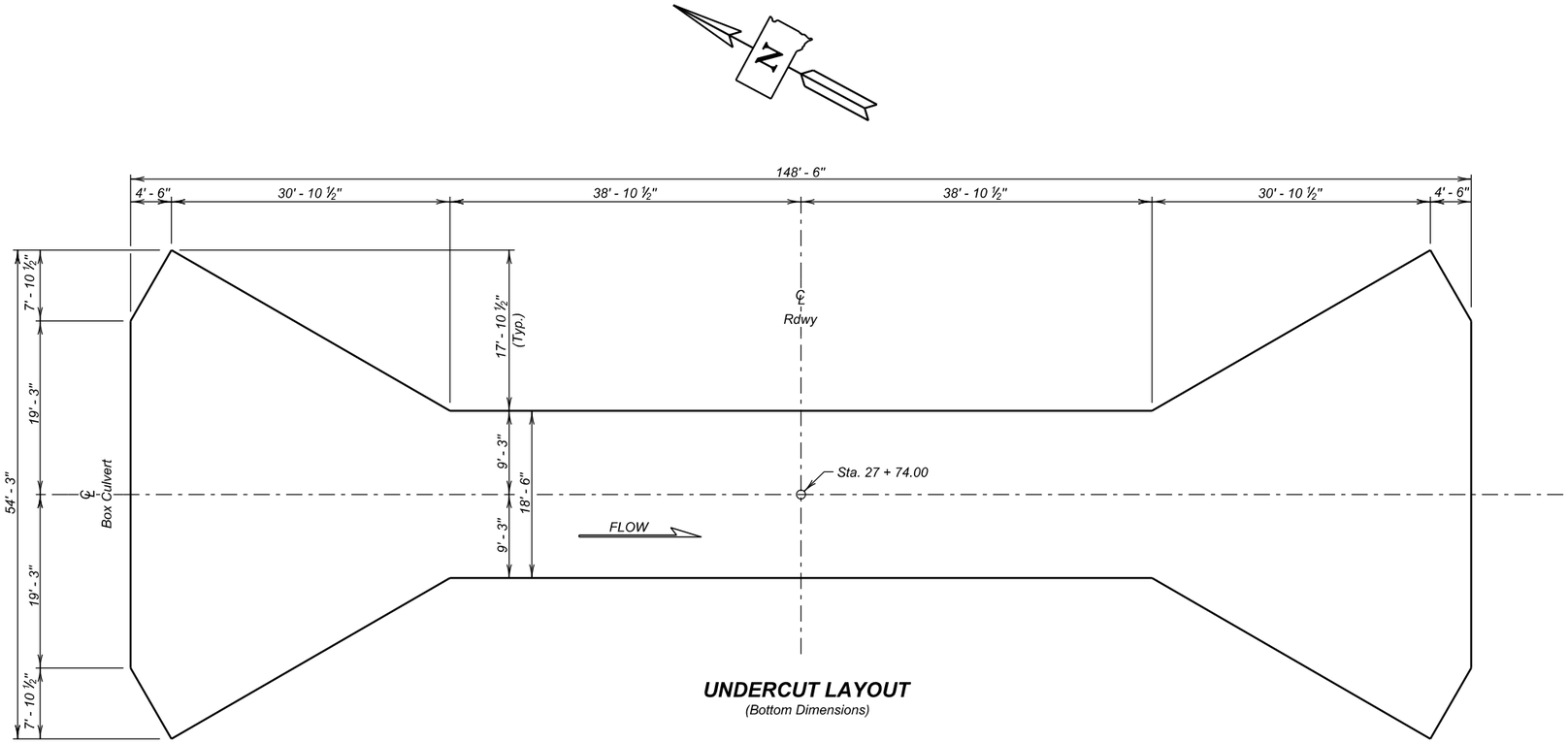
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	NH-P 0042(89)	E4	E10

SPECIFICATIONS

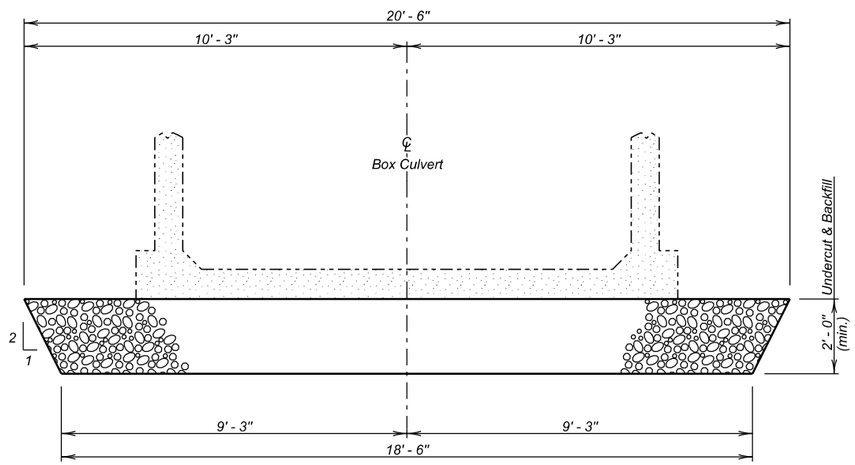
1. *Design Specifications: AASHTO LRFD Bridge Design Specifications, 9th Edition.*
2. *Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, 10-1-25 Version, Required Provisions, and Special Provisions as included in the Proposal. The Standard Specifications for Roads and Bridges are available for download and viewing at: https://dot.sd.gov/doing-business/contractors/standard-specifications*

GENERAL NOTES

1. *Design Live Load: HL-93 and construction load consisting of one 7' - 6" gage axles spaced 30 ft. apart with gross axle weight (each axle) = 95,850 lbs. The construction load will not be applied until a minimum of 4 ft. of fill has been placed over the Box Culvert. Other construction loads in excess of legal load must be submitted thru proper channels to the Office of Bridge Design for analysis.*
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 9 ft. (F9).*
3. *Design Material Strengths: Concrete f'c = 4500 p.s.i.*
   Reinforcing Steel fy = 60000 p.s.i.
4. *High sulfate levels are likely to be encountered on this project. All concrete will be Class A45 Concrete, Box Culvert conforming to Section 460 of the Construction Specifications, with the following modifications: the type of cement will be either a type V or a type II with 20% to 25% Class F Modified Fly Ash substituted for cement in accordance with Section 605 of the Construction Specifications.*
5. *All reinforcing steel will conform to ASTM A615 Grade 60.*
6. *All lap splices shown are contact lap splices unless noted otherwise.*
7. *All exposed edges will be chamfered ¾ inch unless noted otherwise in the plans.*
8. *Use 1 inch clear cover on all reinforcing steel EXCEPT as shown.*
9. *The Contractor will imprint on the structure the date of construction as specified and detailed on Standard Plate No. 460.02.*
10. *Care will be taken to establish Working Points (W.P.) as shown on the wings.*
11. *Circled numbers in PLAN and ELEVATION views on the General Drawing are section I.D. Numbers (see SDDOT Materials Manual).*
12. *Cost of Preformed Expansion Joint Filler used in apron construction will be incidental to the other contract items.*
13. *Soils below the bottom of the proposed RCBC consist of brown silt clay.*
14. *Groundwater was encountered in the borings at an elevation of 2968.3 feet during the subsurface investigation conducted in June 2022. Dewatering will be required during the construction of the RCBC. All costs incurred for dewatering will be incidental to other contract items.*



UNDERCUT LAYOUT
(Bottom Dimensions)



TYPICAL SECTION
(For Limits of Undercut)

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
℄ Box Culvert Undercut	Cu. Yd.	318

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

NOTES AND UNDERCUT DETAILS

FOR

12' X 12' BOX CULVERT

OVER HILDERBRAND CREEK — 0° SKEW
STA. 27 + 74.00 — SEC. 23-T11N-R3E
STR. NO. 10-169-215 — NH-P 0042(89)
HL-93

BUTTE COUNTY

S. D. DEPT. OF TRANSPORTATION

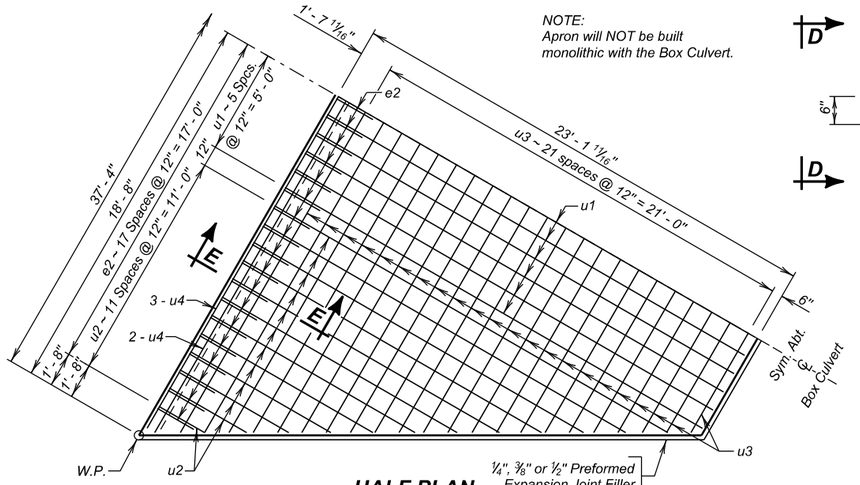
JULY 2024

2 OF 7

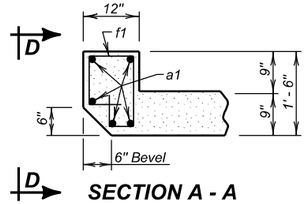
DESIGNED BY	CK. DES. BY	DRAFTED BY	
BR	ER	BT	Steve A Johnson BRIDGE ENGINEER
BUTE07NU	07NUGA02		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	NH-P 0042(89)	E5	E10

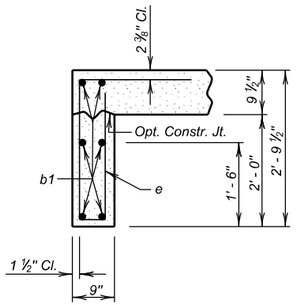
NOTE:
Apron will NOT be built monolithic with the Box Culvert.



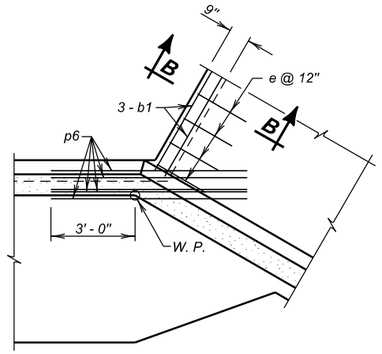
HALF PLAN
(Inlet Apron)



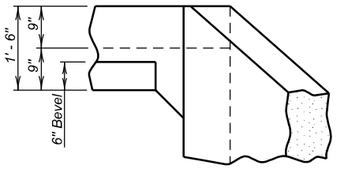
SECTION A - A
(At Top Slab)



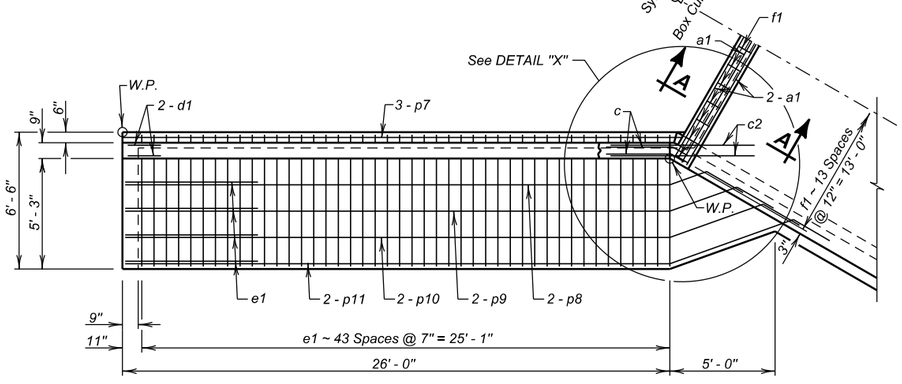
SECTION B - B



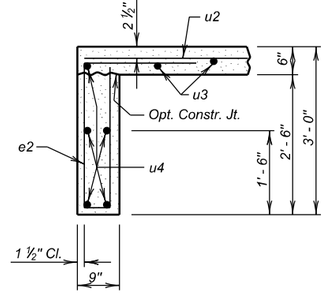
DETAIL "X"
(At Bottom Slab)



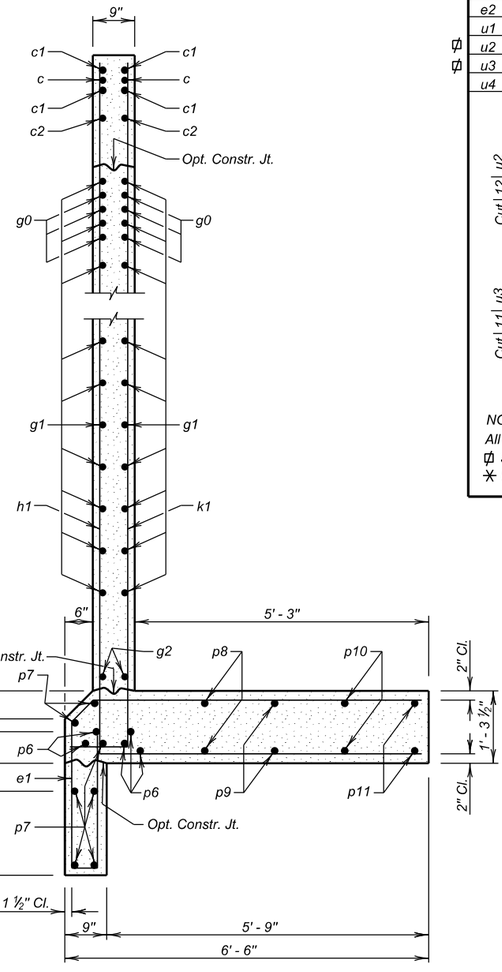
VIEW D - D
(At Exterior Wall)



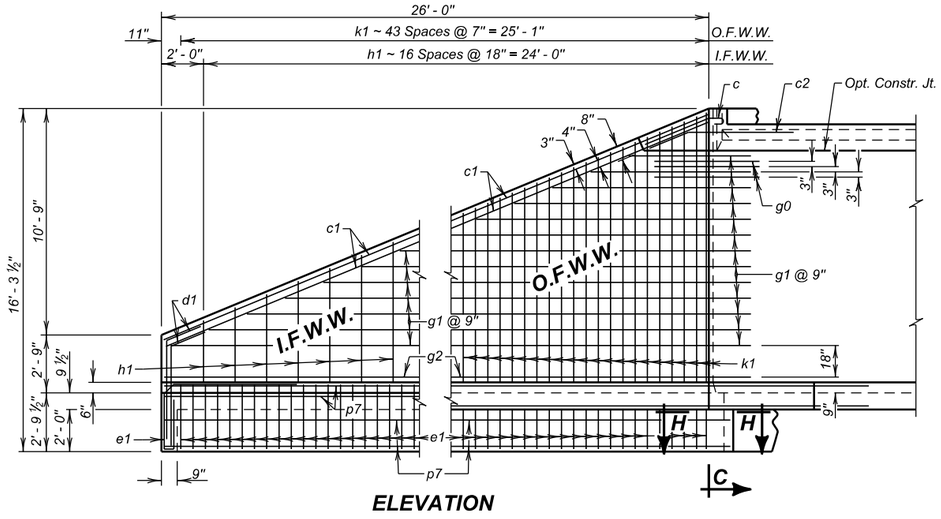
HALF PLAN



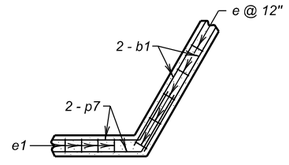
SECTION E - E



SECTION C - C



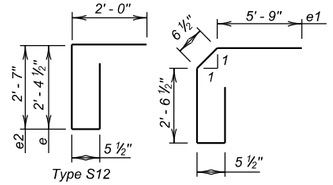
ELEVATION

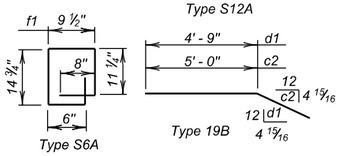


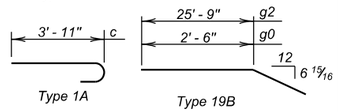
SECTION H - H

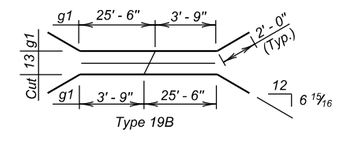
REINFORCING SCHEDULE

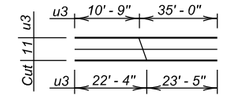
	Mk.	No.	Size	Length	Type	Bending Details
	a1	5	6	13' - 3"	Str.	
	b1	6	6	11' - 3"	Str.	
✳	c	4	5	4' - 6"	1A	
	c1	8	5	28' - 0"	Str.	
	c2	4	5	7' - 0"	19B	
	d1	8	5	6' - 6"	19B	
	e	12	4	7' - 0"	S12	
	e1	96	4	11' - 9"	S12A	
	f1	14	4	4' - 9"	S6A	
	g0	12	5	5' - 0"	19B	
⌀	g1	26	4	33' - 3"	19B	
	g2	4	4	27' - 9"	19B	
⌀	h1	17	4	29' - 6"	17A	
⌀	k1	44	4	19' - 6"	17A	
	p6	10	6	7' - 0"	Str.	
✳	p7	14	4	28' - 6"	Str.	
✳	p8	4	4	29' - 6"	Str.	
✳	p9	4	4	30' - 9"	Str.	
✳	p10	4	4	32' - 3"	Str.	
✳	p11	4	4	33' - 9"	Str.	
	OUTLET APRON					
	e2	35	4	7' - 6"	S12	
	u1	11	4	22' - 9"	Str.	
⌀	u2	12	4	24' - 0"	Str.	
⌀	u3	11	4	45' - 9"	Str.	
	u4	5	4	36' - 3"	Str.	

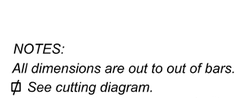


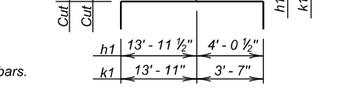












NOTES:
All dimensions are out to out of bars.
⌀ See cutting diagram.
✳ Bend in field as necessary to fit.

ESTIMATED QUANTITIES

ITEM	Class A45 Concrete, Box Culvert	Reinforcing Steel	Structure Excavation, Box Culvert
UNIT	Cu. Yd.	Lb.	Cu. Yd.
Inlet	34.3	3722	15.3
Inlet Apron	12.8	992	12.8

LEGEND FOR PLACING RE-STEEL

O. F. W. W. - Outside Face of Wing Wall
I. F. W. W. - Inside Face of Wing Wall

INLET DETAILS
FOR
12' X 12' BOX CULVERT

OVER HILDERBRAND CREEK — 0° SKEW
STA. 27 + 74.00 — SEC. 23-T11N-R3E
STR. NO. 10-169-215 — NH-P 0042(89)
HL-93

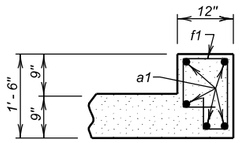
BUTTE COUNTY
S. D. DEPT. OF TRANSPORTATION
JULY 2024

3 OF 7

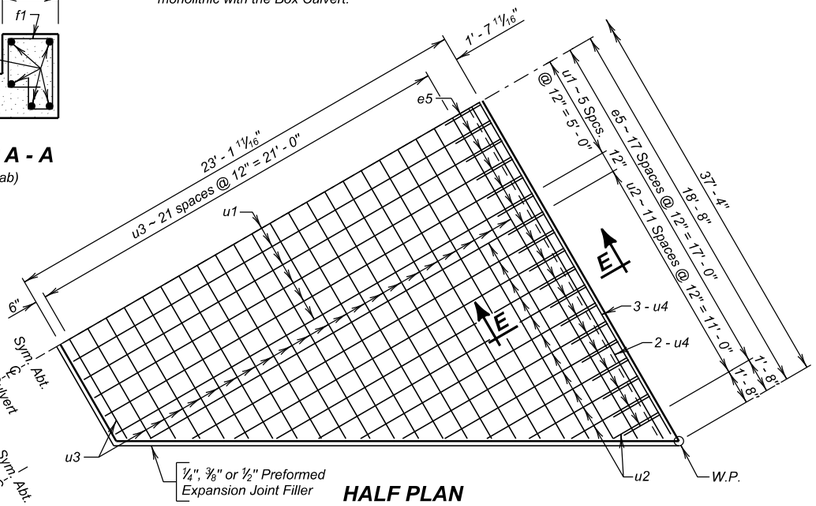
DESIGNED BY	CK. DES. BY	DRAFTED BY	
BR	ER	BT	Steve A Johnson BRIDGE ENGINEER
BUTE07NU	07NUGA03		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	NH-P 0042(89)	E6	E10

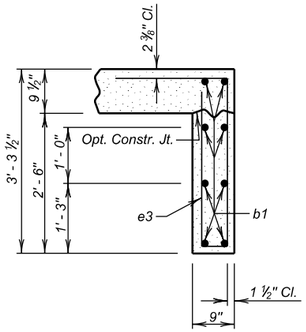
NOTE:
Apron will NOT be built monolithic with the Box Culvert.



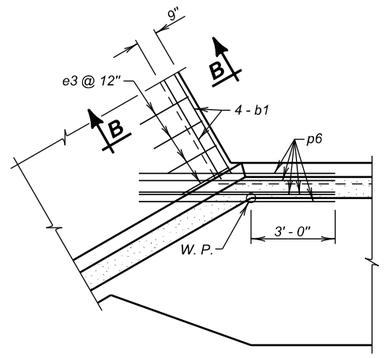
SECTION A - A
(At Top Slab)



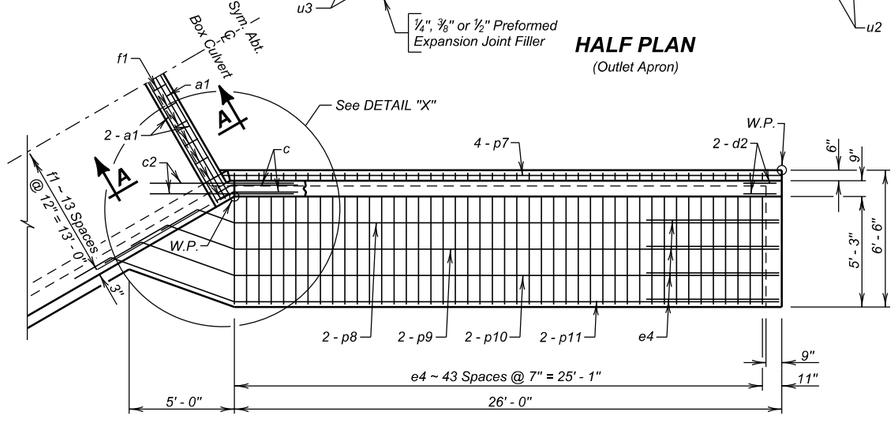
HALF PLAN
(Outlet Apron)



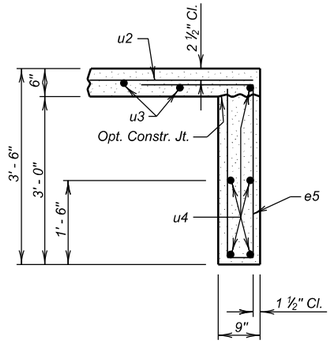
SECTION B - B



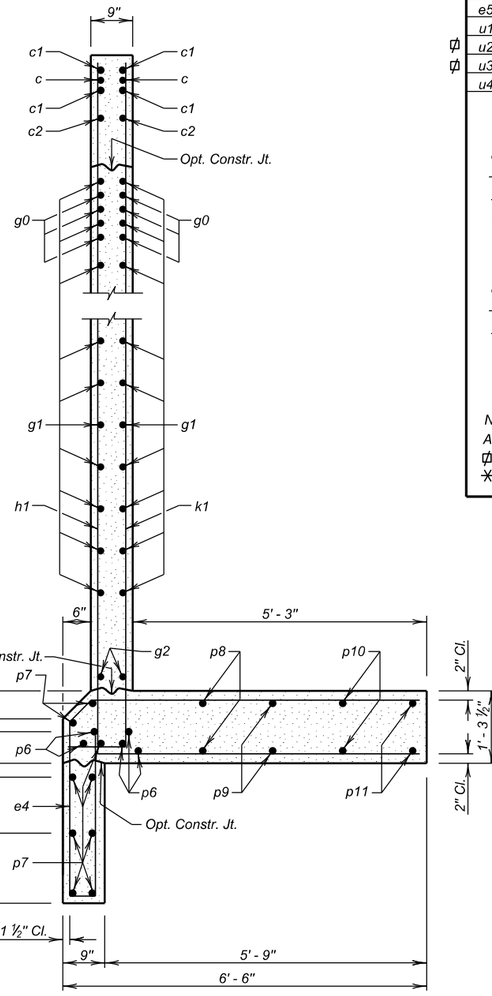
DETAIL "X"
(At Bottom Slab)



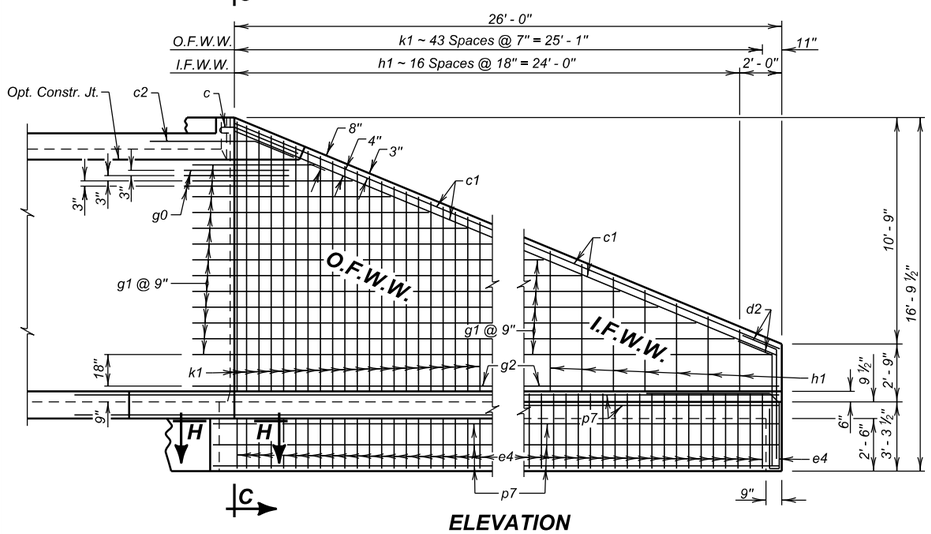
HALF PLAN



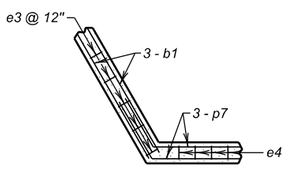
SECTION E - E



SECTION C - C



ELEVATION



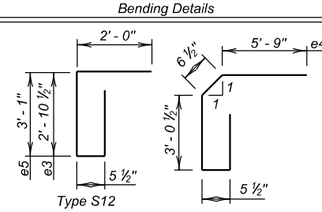
SECTION H - H

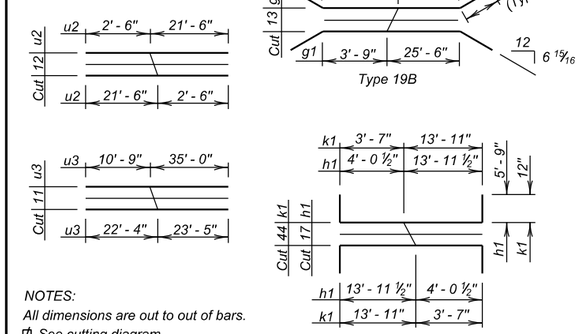
LEGEND FOR PLACING RE-STEEL

O. F. W. W. - Outside Face of Wing Wall
I. F. W. W. - Inside Face of Wing Wall

REINFORCING SCHEDULE

Mk.	No.	Size	Length	Type	Bending Details
a1	5	6	13' - 3"	Str.	
b1	8	6	11' - 3"	Str.	
* c	4	5	4' - 6"	1A	
c1	8	5	28' - 0"	Str.	
c2	4	5	7' - 0"	19B	
d2	8	5	7' - 0"	19B	
e3	12	4	8' - 0"	S12	
e4	96	4	12' - 9"	S12A	
f1	14	4	4' - 9"	S6A	
g0	12	5	5' - 0"	19B	
⌀ g1	26	4	33' - 3"	19B	
g2	4	4	27' - 9"	19B	
⌀ h1	17	4	29' - 6"	17A	
⌀ k1	44	4	19' - 6"	17A	
p6	10	6	7' - 0"	Str.	
* p7	18	4	28' - 6"	Str.	
* p8	4	4	29' - 6"	Str.	
* p9	4	4	30' - 9"	Str.	
* p10	4	4	32' - 3"	Str.	
* p11	4	4	33' - 9"	Str.	
OUTLET APRON					
e5	35	4	8' - 6"	S12	
u1	11	4	22' - 9"	Str.	
⌀ u2	12	4	24' - 0"	Str.	
⌀ u3	11	4	45' - 9"	Str.	
u4	5	4	36' - 3"	Str.	





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

ESTIMATED QUANTITIES

ITEM	Class A45 Concrete, Box Culvert	Reinforcing Steel	Structure Excavation, Box Culvert
UNIT	Cu. Yd.	Lb.	Cu. Yd.
Outlet	35.4	3908	16.4
Outlet Apron	13.3	1016	13.3

OUTLET DETAILS
FOR
12' X 12' BOX CULVERT

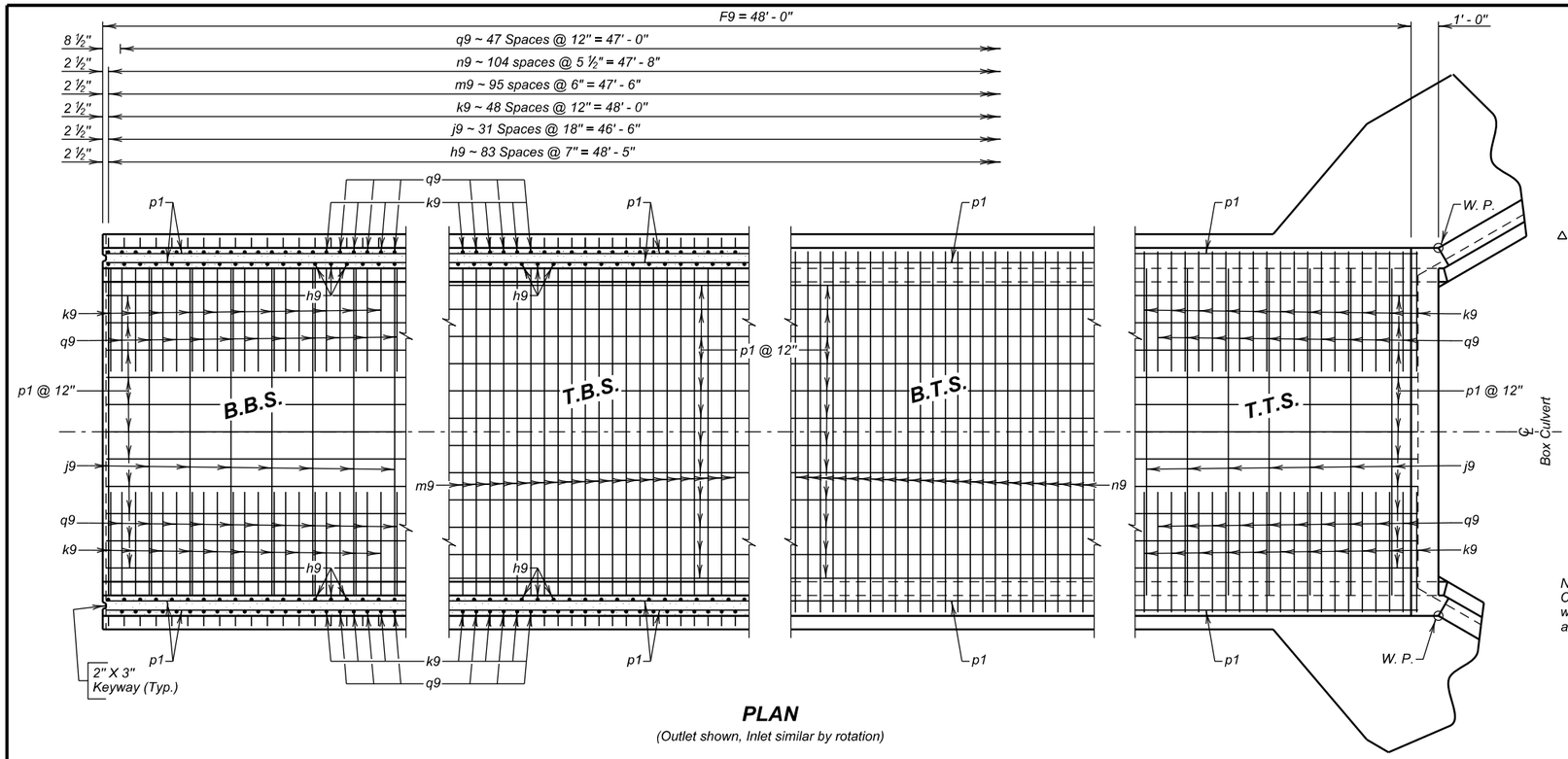
OVER HILDERBRAND CREEK — 0° SKEW
STA. 27 + 74.00 — SEC. 23-T11N-R3E
STR. NO. 10-169-215 — NH-P 0042(89)
HL-93

BUTTE COUNTY
S. D. DEPT. OF TRANSPORTATION
JULY 2024

4 OF 7

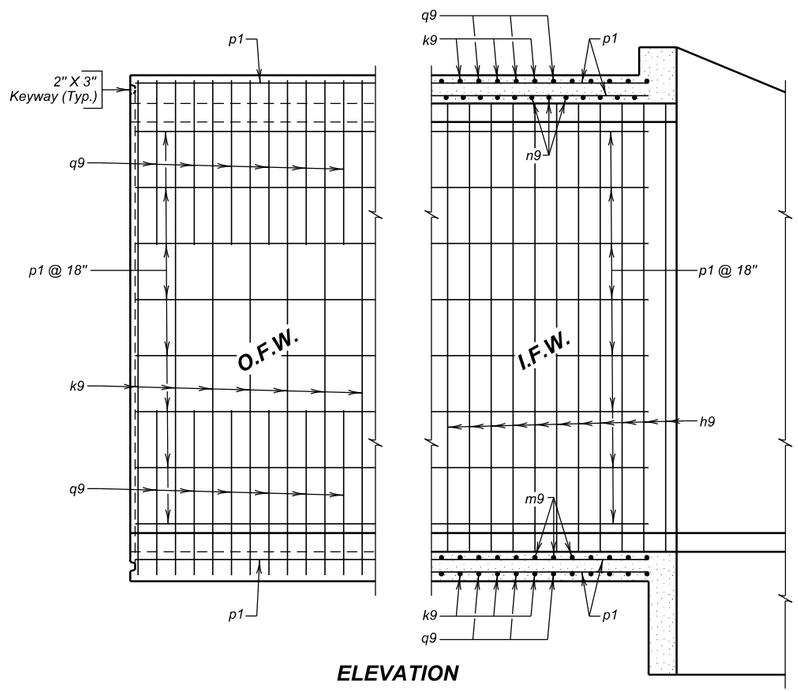
DESIGNED BY	CK. DES. BY	DRAFTED BY	
BR	ER	BT	Steve A Johnson BRIDGE ENGINEER
BUTE07NU	07NUGA04		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	NH-P 0042(89)	E7	E10

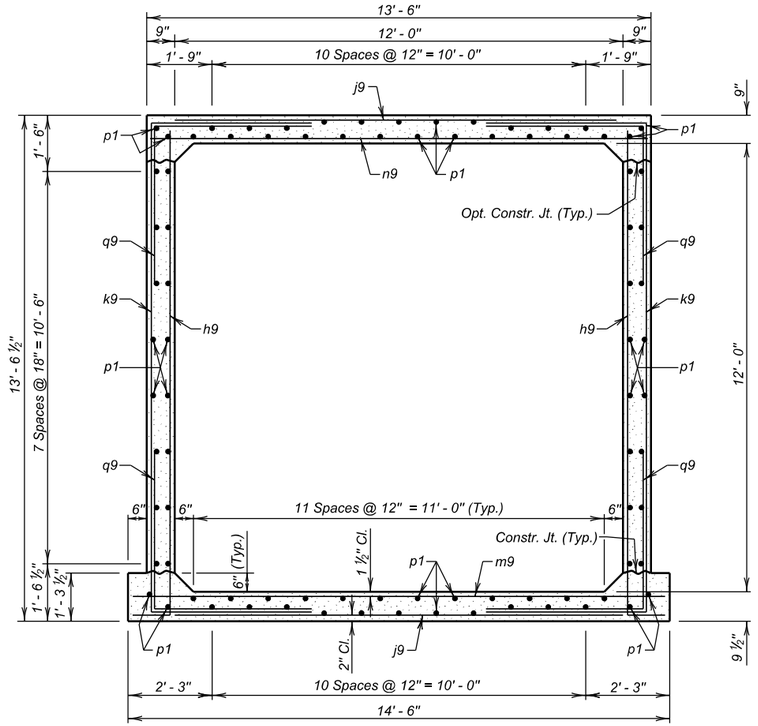


PLAN

(Outlet shown, Inlet similar by rotation)



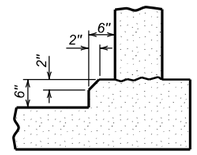
ELEVATION



F9 BARREL SECTION

(9' - 0" Maximum Fill)

△ *Place z1 bars thru construction joint between barrel sections as shown on Standard Plate No. 460.10. Quantity of z1 bars is for one construction joint.*



OPTIONAL FILLET DETAIL

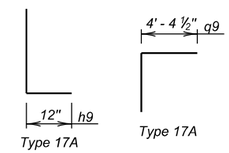
(At Bottom Slab)

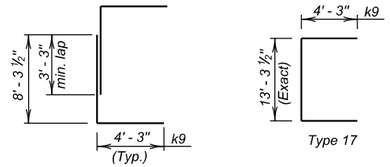
NOTE:
Contractor may form the optional full fillet, with 2" Chamfer, as detailed. The cost of the additional concrete will be borne by the Contractor.

REINFORCING SCHEDULE

(For 2 - F9 Barrel End Sections)

	Mk.	No.	Size	Length	Type	Bending Details
	h9	336	4	14' - 0"	17A	
	j9	128	4	12' - 0"	Str.	
	k9	200	6	21' - 9"	17	
	m9	192	7	14' - 3"	Str.	
	n9	210	6	13' - 3"	Str.	
	p1	172	4	48' - 3"	Str.	
	q9	384	6	8' - 9"	17A	
△	z1	40	5	3' - 6"	Str.	





OPTIONAL k9 SPLICE DETAIL

Contractor may use optional reinforcing steel splice, as shown. The cost of the additional reinforcing steel shall be borne by the Contractor.

NOTES:

All dimensions are out to out of bars.

Request for additional reinforcing steel splices at points other than those shown, must be submitted to the Engineer for prior approval. If additional splices are approved, no payment will be allowed for the added quantity of reinforcing steel.

ESTIMATED QUANTITIES

ITEM	Class A45 Concrete, Box Culvert	Reinforcing Steel	Structure Excavation, Box Culvert
UNIT	Cu.Yd.	Lb.	Cu.Yd.
2 - F9 Barrel End Sections @ 48' - 0"	144.4	31210	40.8

LEGEND FOR PLACING RE-STEEL

T.T.S.	- Top of Top Slab
B.T.S.	- Bottom of Top Slab
T.B.S.	- Top of Bottom Slab
B.B.S.	- Bottom of Bottom Slab
O.F.W.	- Outside Face of Wall
I.F.W.	- Inside Face of Wall

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 conforming to the keyway dimensions and location as shown on the plans. The keyway length will be full width of the bottom slab. Care will be taken to maintain proper alignment of the keyway during the pour sequence. All additional costs of this option will be borne by the Contractor.

F9 BARREL END SECTION DETAILS (48' - 0")

FOR

12' X 12' BOX CULVERT

OVER HILDERBRAND CREEK — 0° SKEW
STA. 27 + 74.00 — SEC. 23-T11N-R3E
STR. NO. 10-169-215 — NH-P 0042(89)
HL-93

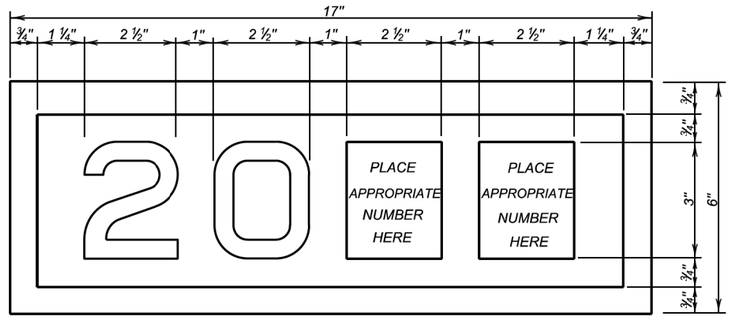
BUTTE COUNTY

S. D. DEPT. OF TRANSPORTATION

JULY 2024

5 OF 7

DESIGNED BY	CK. DES. BY	DRAFTED BY	
BR	ER	BT	Steven A Johnson BRIDGE ENGINEER
BUTE07NU	07NUGA05		



YEAR PLATE DETAILS

GENERAL NOTES:

1. Year plates of the general dimensions shown will be constructed on all box culverts and bridges. The year plates will be constructed in reverse 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.

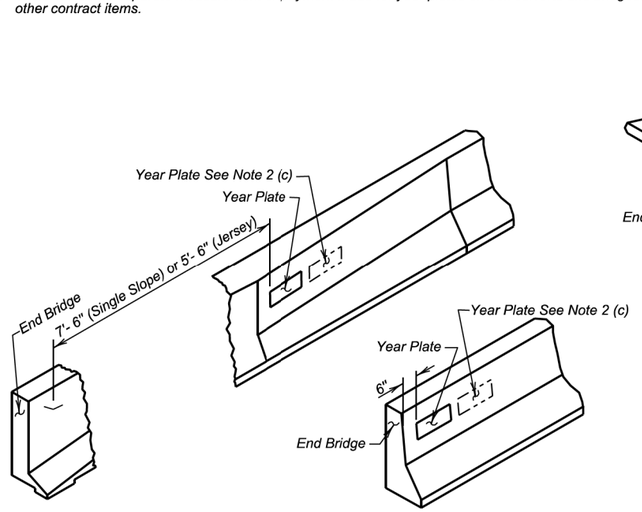
2. Year plates will be located on structure(s) as follows:

   a. On cast-in-place box culverts the year plates will be four and one - half (4 ½) inches below the top of the upstream parapet wall and centered laterally on the upstream face. On precast box culverts the year plate will be centered laterally on the upstream face of the top slab. Where an extended interior wall interferes with this location, the year plate will be centered in an adjacent barrel.

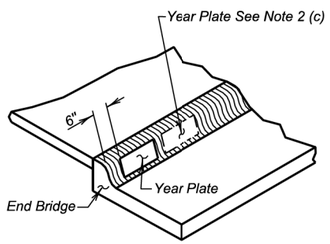
   b. On bridges with six (6) inch curbs, "Jersey" shaped barriers with no endblocks, or "Single Slope" shaped barriers with no endblocks, the year plate will be centered vertically on the curb face approximately six (6) inches from the end of the bridge, or as designated by the Engineer. On bridges with barrier endblocks, the year plate will be centered on the upper sloped portion of the barrier approximately 5'- 6" for "Jersey" shaped barriers from the end of the bridge and 7'-6" for "Single Slope" shaped barriers from the end of bridge, or as designated by the Engineer. There will be one year plate at each end of the bridge on opposite sides.

   c. When the plans specify that both the original date of construction and the date of reconstruction are to be shown, one date will be placed as listed above and the other located adjacent to it. Both year plates will 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 will be incidental to other contract items.

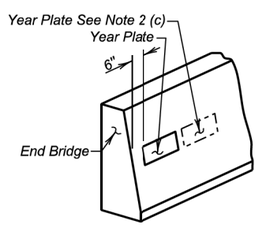


BARRIER
(With Endblock)



TYPE B CURB

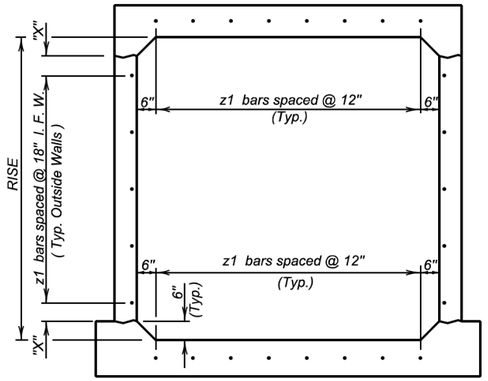
JERSEY BARRIER



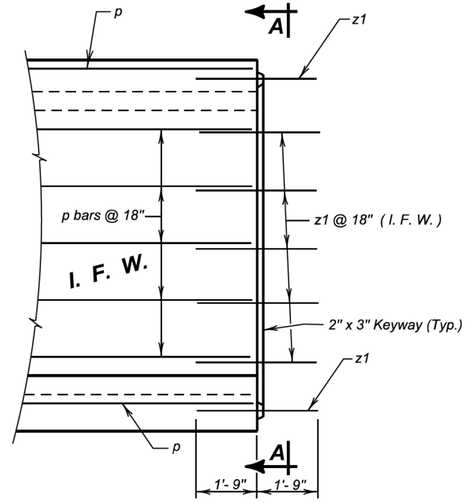
SINGLE SLOPE BARRIER

January 22,2021

Published Date: 2026	SDDOT	YEAR PLATE DETAILS	PLATE NUMBER 460.02
			Sheet 1 Of 1



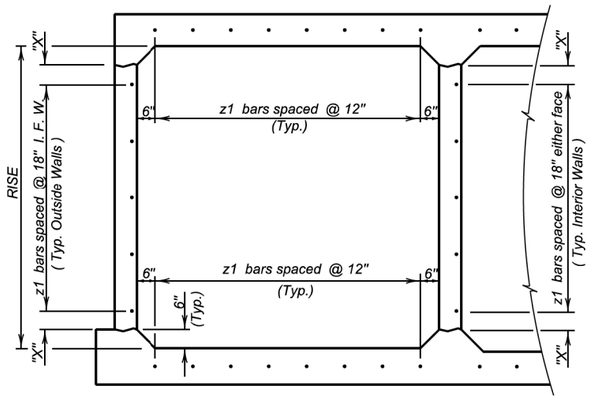
TYPICAL SINGLE BARREL VIEW A - A



ELEVATION

LEGEND FOR PLACING RE-STEEL
I. F. W. - Inside Face Wall

RISE	"X"
3'- 0"	3"
4'- 0"	9"
5'- 0"	6"
6'- 0"	3"
7'- 0"	9"
8'- 0"	6"
9'- 0"	3"
10'- 0"	9"
11'- 0"	6"
12'- 0"	3"
13'- 0"	9"
14'- 0"	6"



TYPICAL MULTIPLE BARREL VIEW A - A

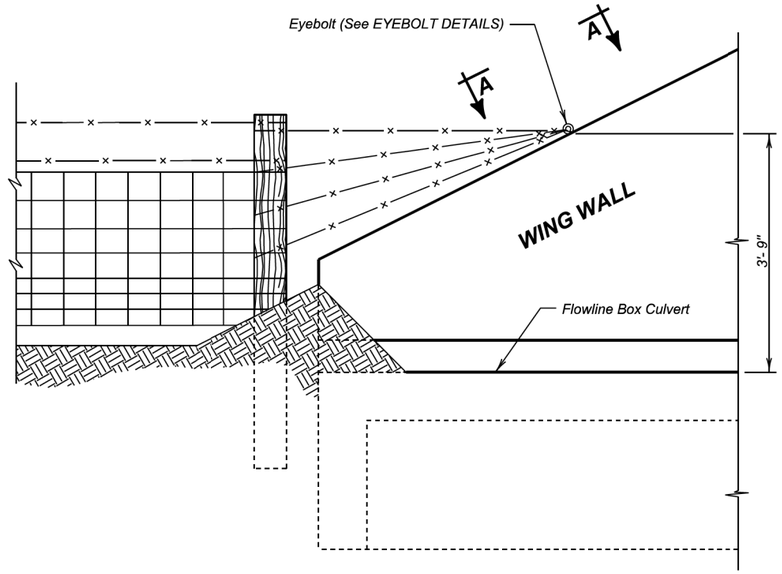
GENERAL NOTES:

1. z1 bars will be placed in the middle of the 2" X 3" keyway in the top and bottom slabs. z1 bars will be lapped with the longitudinal p bars in the inside face of the wall for outside walls and in either face for interior walls. z1 bars are listed and included elsewhere in plans.

2. Drainage Fabric Protection will be placed in accordance with Section 422, or Section 560, whichever is applicable.

June 1, 2022

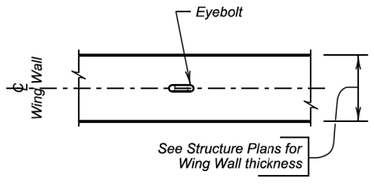
Published Date: 2026	SDDOT	BOX CULVERT BARREL TIE REINFORCEMENT	PLATE NUMBER 460.10
			Sheet 1 of 1



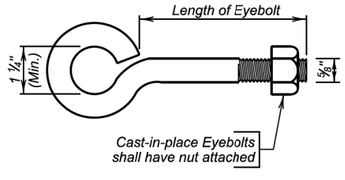
DETAIL FOR FENCE ANCHORS

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 ⅞ inch diameter and shall conform to ASTM A307.
4. Eyebolts, nuts, and concrete inserts shall be galvanized in accordance with AASHTO M232 (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 ⅞ inch diameter threaded eyebolt, may be used and shall be set in the concrete 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 incidental to various contract items.



VIEW A - A



EYEBOLT DETAILS

December 23,2012

Published Date: 2026	SDDOT	FENCE ANCHORS FOR BOX CULVERT WING WALLS	PLATE NUMBER 620.16
			Sheet 1 of 1

12' X 12' BOX CULVERT
STR. NO. 10-169-215
JULY 2024

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	NH-P 0042(89)	E10	E10

SPECIFICATIONS

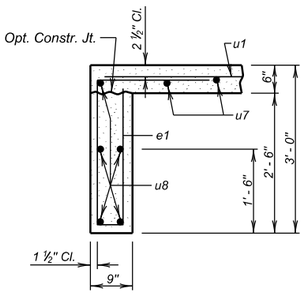
1. *Design Specifications: AASHTO Standard Specifications for Highway Bridges, 17th Edition (Service Load).*
2. *Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, 10-1-25 Version, Required Provisions, and Special Provisions as included in the Proposal. The Standard Specifications for Roads and Bridges are available for download and viewing at: https://dot.sd.gov/doing-business/contractors/standard-specifications*

GENERAL NOTES

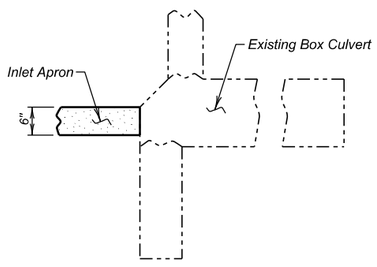
1. *All concrete will be Class A45 conforming to Section 460.*
2. *All reinforcing steel will conform to ASTM A615 Grade 60.*
3. *All exposed edges will be chamfered ¾ inch.*
4. *Removal of the existing apron will be included in contract for Breakout Structural Concrete. This payment will be full compensation for furnishing all materials, labor, tools, and equipment necessary or incidental to removal of the existing apron. Payment includes, but is not limited to, excavation required to perform the removal of the existing apron and removing and disposing of all waste materials to satisfactorily complete the work.*
5. *Cost of Preformed Expansion Joint Filler used in apron construction will be incidental to the other contract items.*
6. *Any additional excavation required to construct the new apron will be incidental to the contract unit price per cubic yard for Structure Excavation, Box Culvert. Measurement will not be made for Structure Excavation, Box Culvert. Plans quantitiy will be used for payment.*

DIMENSIONS OF EXISTING BOX CULVERT

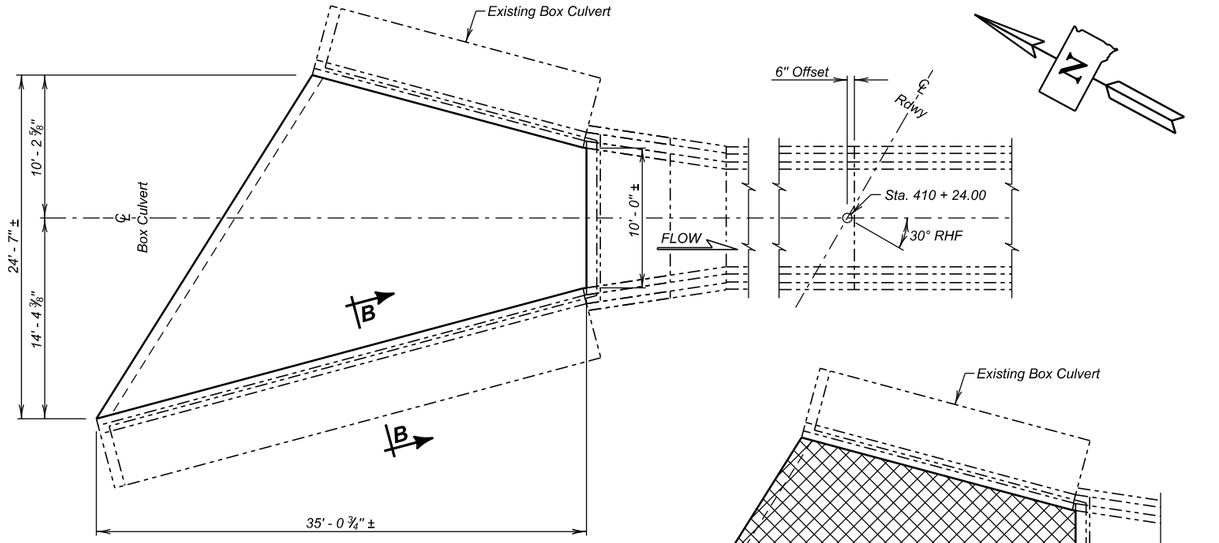
All details and dimensions of the Existing Box Culvert, contained in these plans, are provided as information only. It is the Contractor's responsibility to inspect and verify actual field conditions and any necessary dimensions affecting the satisfactory completion of the work required for this project. Original construction plans can be obtained from the Office of Bridge Design.



SECTION A - A



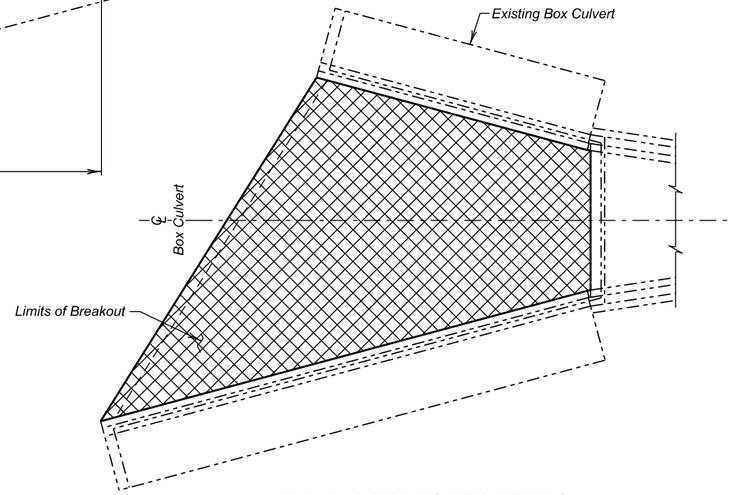
SECTION B - B



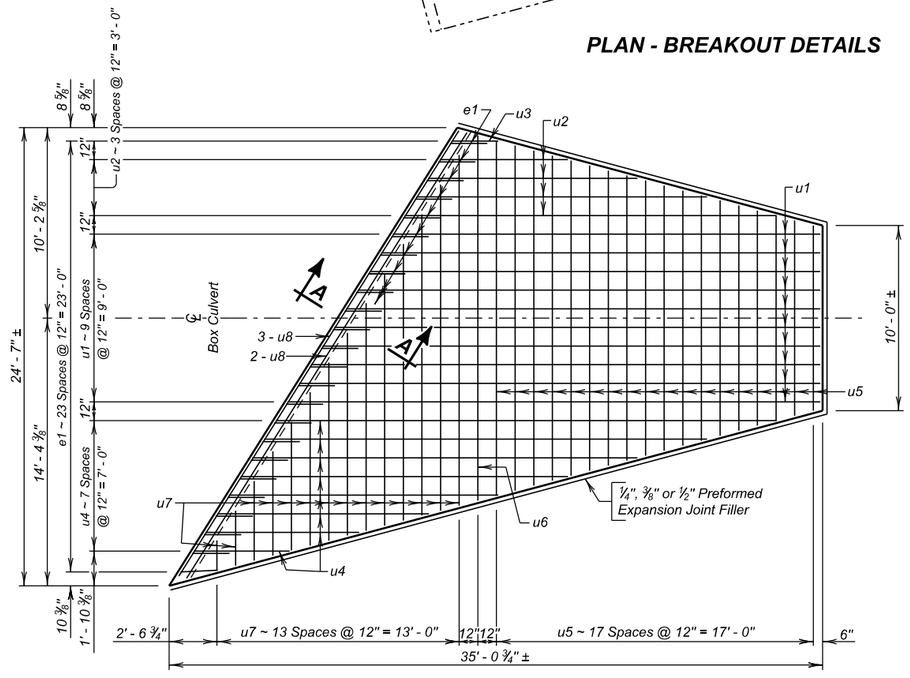
PLAN

NOTES:

1. *Apron will NOT be built monolithic with the Box Culvert.*
2. *The intent is to match the existing box location, flowline and slope.*



PLAN - BREAKOUT DETAILS

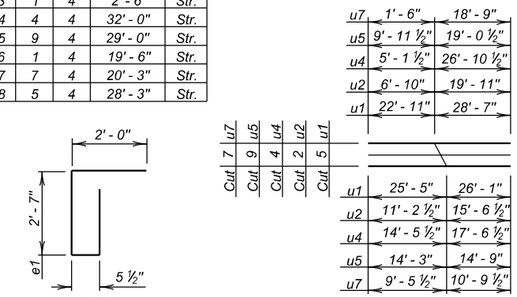


PLAN
(Inlet Apron)

REINFORCING SCHEDULE

Mk.	No.	Size	Length	Type
e1	24	4	7' - 6"	S12
u1	5	4	51' - 6"	Str.
u2	2	4	26' - 9"	Str.
u3	1	4	2' - 6"	Str.
u4	4	4	32' - 0"	Str.
u5	9	4	29' - 0"	Str.
u6	1	4	19' - 6"	Str.
u7	7	4	20' - 3"	Str.
u8	5	4	28' - 3"	Str.

Bending Details



NOTES:
All dimensions are out to out of bars.
℄ See cutting diagram.

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY
Class A45 Concrete, Box Culvert	Cu. Yd.	10.4
Reinforcing Steel	Lb.	792
Structure Excavation, Box Culvert	Cu. Yd.	11
Breakout Structural Concrete	Cu. Yd.	10.4

NOTE:
The intent is to match the existing box location, flowline and slope.

NOTES AND INLET APRON REPAIR

FOR

SPECIAL 8' X 8' BOX CULVERT

STA. 410 + 24.00 — 30°RHF SKEW

STR. NO. 32-148-260 — SEC. 28/33-T19N-R3E

NH-P 0042(89)

HARDING COUNTY

S. D. DEPT. OF TRANSPORTATION

JULY 2024

1 OF 1

DESIGNED BY	CK. DES. BY	DRAFTED BY	
BT	ER	BT	Steve A Johnson BRIDGE ENGINEER
HARD07NU	07NUTB01		