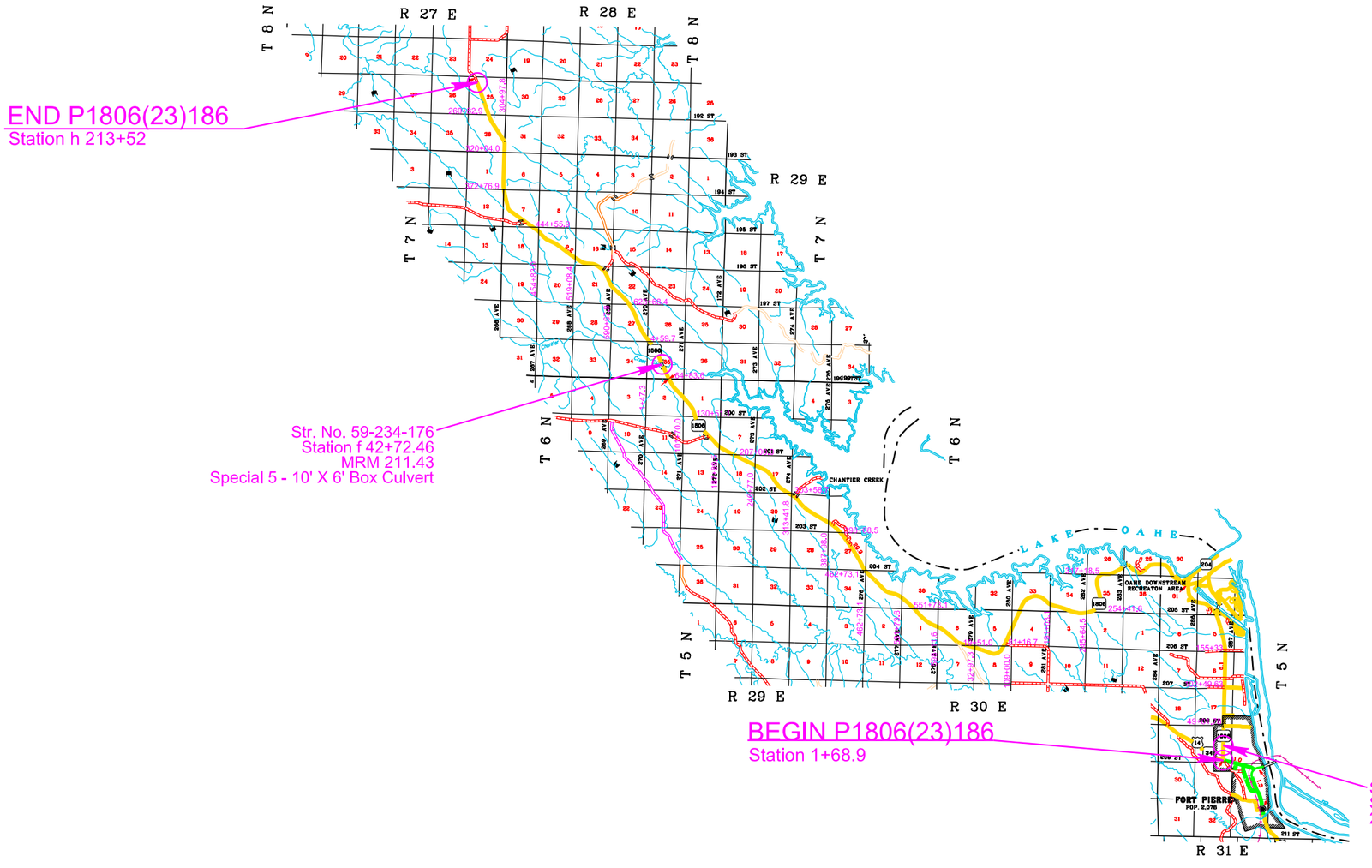
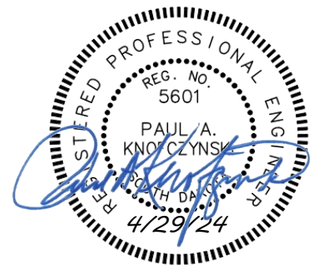
SECTION E: STRUCTURE PLANS

KLJ	STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
		P 1806(23)186	E1	E5

Rev 4-24-24 EJW

INDEX OF SHEETS





Plot Scale - 1:200

Plotted From - evanwolf

File - ...\Sections\Section E\titleE.dgn

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 1806(23)186	E2	E5

Rev 6/17/24 pk

ESTIMATE OF QUANTITIES

Str. No. 59-388-274

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
410E0030	Structural Steel, Miscellaneous	Lump Sum	LS
700E0210	Class B Riprap	120.7	Ton
831E0110	Type B Drainage Fabric	145	SqYd

Str. No. 59-234-176

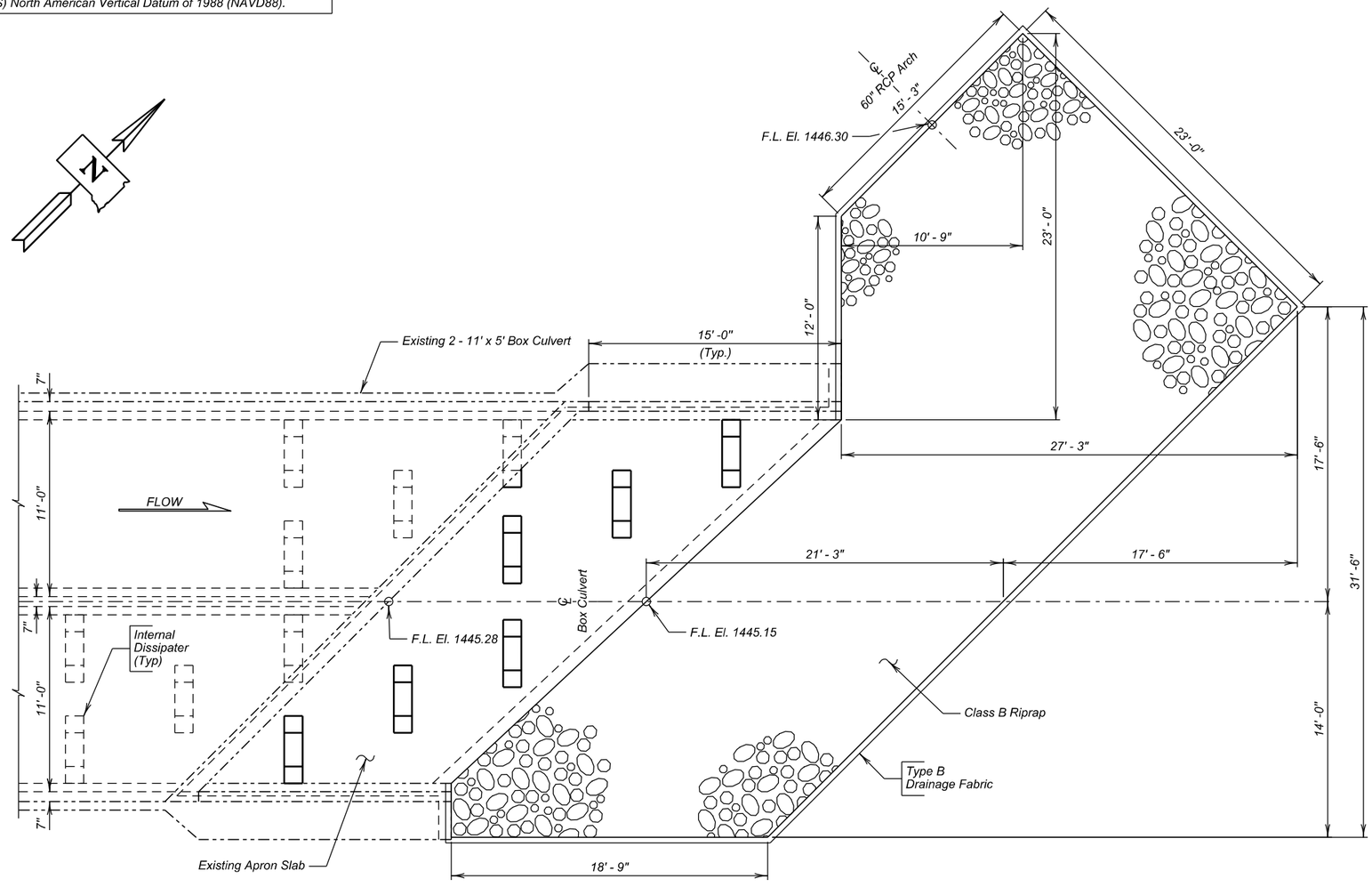
BID ITEM NUMBER	ITEM	QUANTITY	UNIT
420E0200	Structure Excavation, Box Culvert	31	CuYd
460E0120	Class A45 Concrete, Box Culvert	31.3	CuYd
460E0300	Breakout Structural Concrete	28.2	CuYd
480E0100	Reinforcing Steel	2,365	Lb

REGISTERED PROFESSIONAL ENGINEER
REG. No. 5601
PAUL A. KNOFCZYNSKI
SOUTH DAKOTA
6/17/24

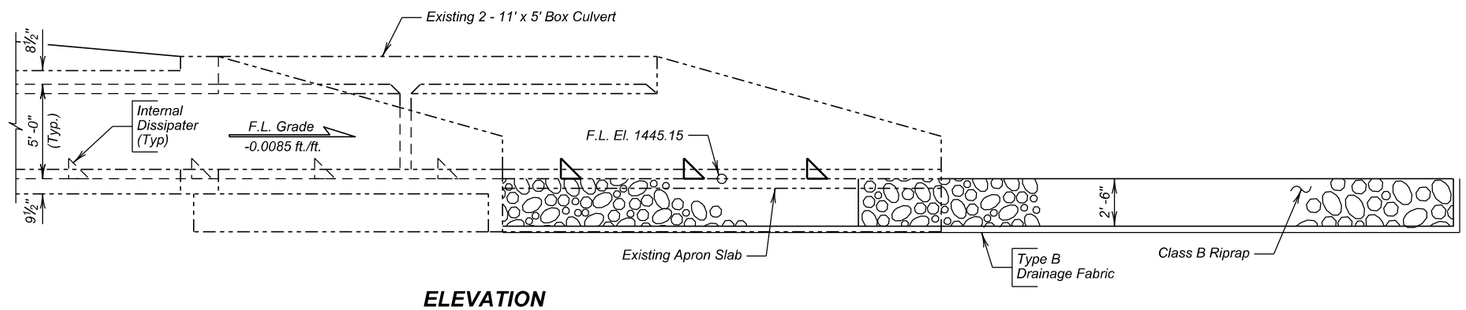
The elevations shown in these plans are based on the National Geodetic Survey (NGS) North American Vertical Datum of 1988 (NAVD88).

KLJ	STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
		P 1806(23)186	E3	E5

Rev 6/17/24 pk



PLAN



ELEVATION

-X028-
INDEX OF CULVERT SHEETS-

ESTIMATED QUANTITIES

	ITEM	UNIT	QUANTITY
⊛	Structural Steel, Miscellaneous	LS	Lump Sum
#	Class B Riprap	Ton	120.7
	Type B Drainage Fabric	Sq. Yd.	145

⊛For informational purposes only, the estimated weight of the Structural Steel Miscellaneous is 2646 pounds.

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

HYDRAULIC DATA

Q_d	545 cfs
A_d	43 sq.ft.
V_d	12.8 fps
QF	545 cfs
Q_{100}	809 cfs
V_{max}	14.2 fps

Q_d = Design discharge for the proposed culvert based on 25 year frequency. El. 1450.7

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. 1452.0

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

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 5601
PAUL A. KNOFCZYNSKI
SOUTH DAKOTA
6/17/24

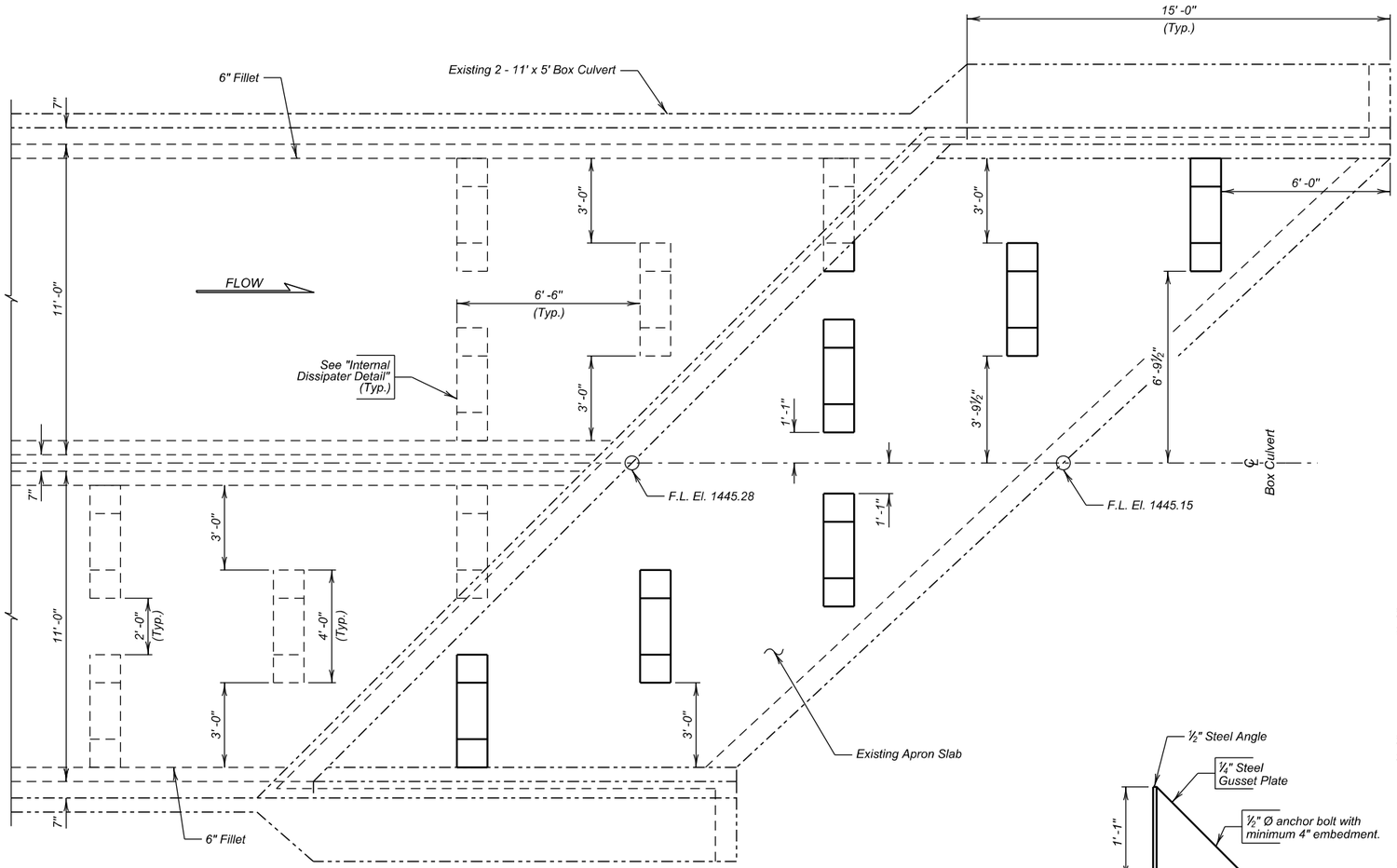
GENERAL DRAWING AND QUANTITIES
FOR
2 - 11' X 5' BOX CULVERT UPGRADE

OVER DRAW — 45° RHF SKEW
STA. 25 + 84.00 — SEC. 20/21-T5N-R31E
STR. NO. 59-388-274 — P 1806(23)186
PCN 06QP — HS 20-44

STANLEY COUNTY
S. D. DEPT. OF TRANSPORTATION
AUGUST 2023

-X028- (1) OF (2)

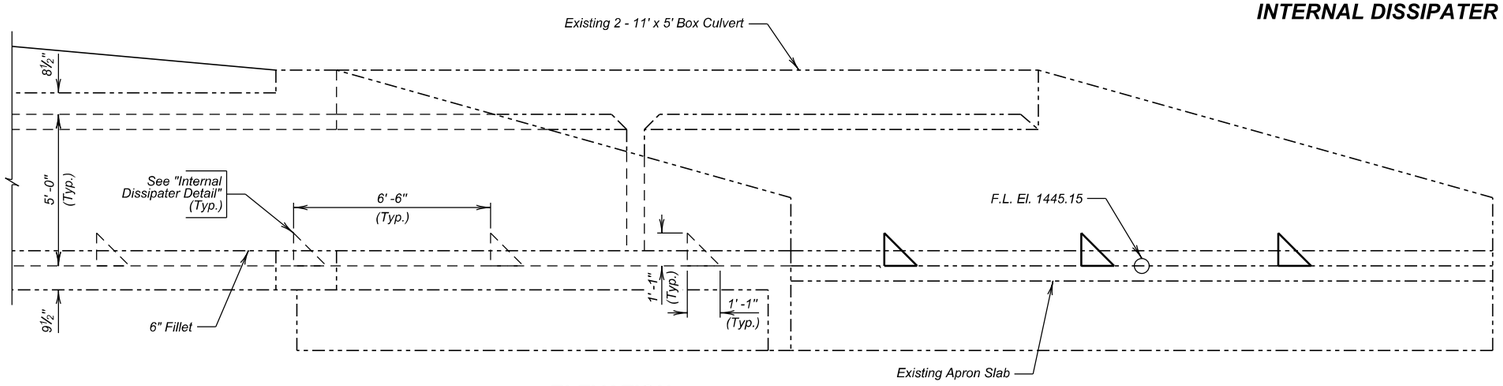
DESIGNED BY	CK. DES. BY	DRAFTED BY	
TR	SM	KD	BRIDGE ENGINEER



PLAN

ELEVATION **PLAN**

INTERNAL DISSIPATER DETAIL



ELEVATION

SPECIFICATIONS

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.

DIMENSIONS OF EXISTING BOX CULVERT

All details and dimensions of the existing box culvert, contained in these plans, are based on the original construction plans and shop plans and as-built information. It is the Contractor's responsibility to inspect and verify the actual field conditions and any necessary dimensions affecting the satisfactory completion of the work required for this project.

STRUCTURAL STEEL, MISCELLANEOUS

All structural steel shall conform to Section 970.2 of the Construction Specifications. Structural steel shall be galvanized in accordance with ASTM B695 Class 55.

BOLTS

All anchor bolts will be ½" diameter F1554, Grade 55 bolts with heavy hex nut and cut washer.

The epoxy resin mixture will be of a type for bonding steel to hardened concrete and will conform to AASHTO M235 Type IV, Grade 3 (Equivalent to ASTM C881 Type IV, Grade 3).

The diameter of the drilled holes will not be less than 1/8-inch greater, nor more than 3/8-inch greater than the diameter of the bolts or as per the manufacturer's recommendations. Holes will not be drilled using core bits. The drilled holes will be blown out with compressed air using a device that will reach the bottom of the hole to ensure that all debris or loose material has been removed prior to epoxy injection.

Mix epoxy resin as recommended by the manufacturer and apply by an injection method as approved by the Engineer. Beginning at the bottom of the drilled holes, fill the holes 1/3 to 1/2 full of epoxy, or as recommended by the manufacturer, prior to insertion of the bolt. Rotate the bolt during installation to elimnate voids and ensure complete bonding of the bolt. Insertion of the bolts by the dipping or painting methods will not be allowed.

No loads will be applied to the epoxy grouted bolt until the epoxy resin has had sufficient time to cure as specified by the epoxy resin manufacturer.

The cost of drilling holes, epoxy resin, bolts, and other incidental items will be incidental to the contract lump sum price for Structural Steel.

SHOP PLANS

Shop plans will be required as specified by the Construction Specifications.

The fabricator will submit shop plans in accordance with the Construction Specifications. Send shop plan submittals to the Construction Engineer. After review, corrections (if necessary), and approval by KLJ Engineering, 18 E Main St Ste 125, Rapid City, SD 57701, the Office of Bridge Design will review the submittals, authorize fabrication, arrange for fabrication inspection, and distribute the shop drawings.

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 5601
PAUL A. KNOFCZYNSKI
SOUTH DAKOTA
6/17/24

DISSIPATER DETAILS AND NOTES
FOR
2 - 11' X 5' BOX CULVERT UPGRADE

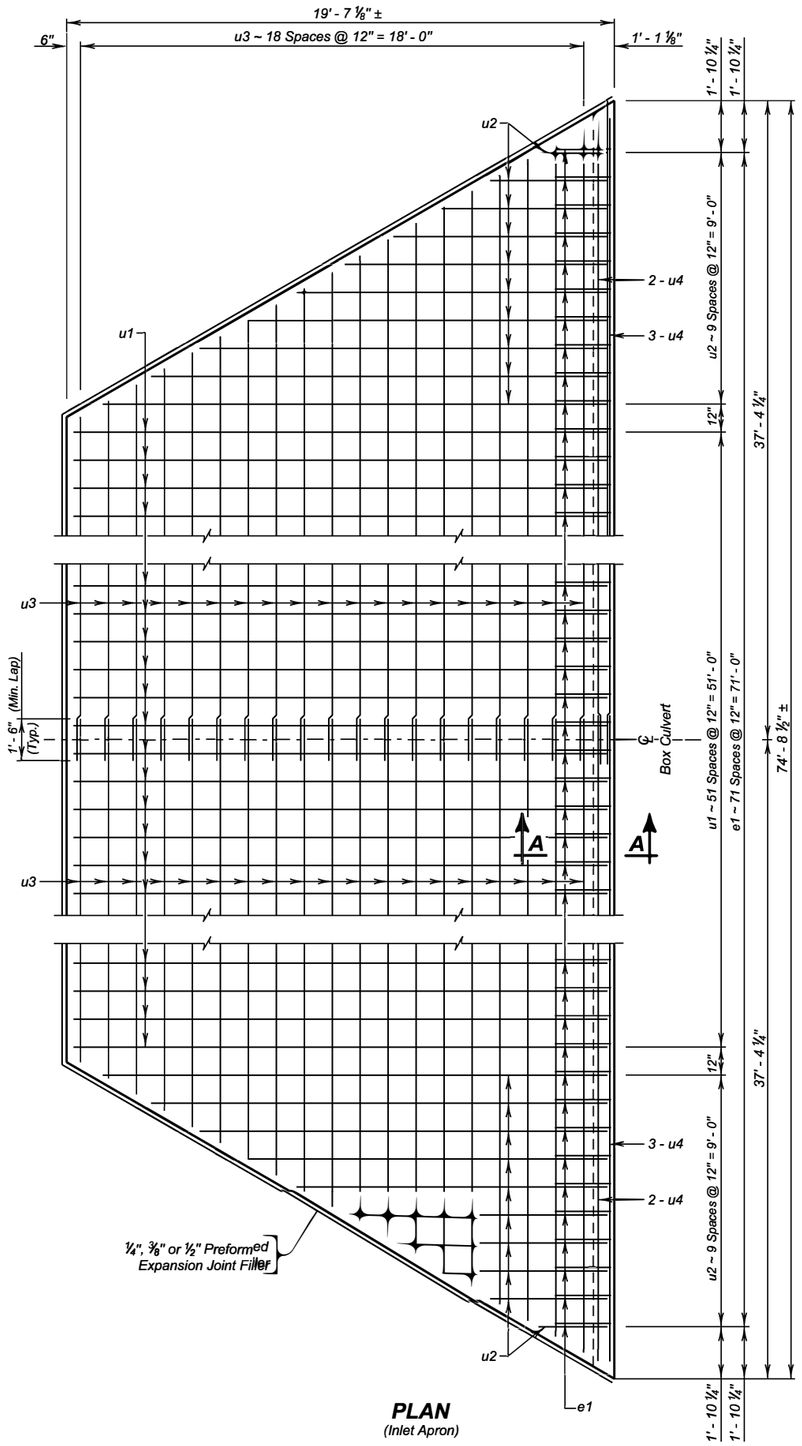
OVER DRAW
STA. 25 + 84.00
STR. NO. 59-388-274

45° RHF SKEW
SEC. 20/21-T5N-R31E
P 1806(23)186
HS 20-44

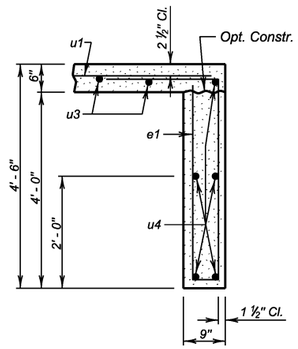
STANLEY COUNTY
S. D. DEPT. OF TRANSPORTATION
AUGUST 2023

DESIGNED BY	CK. DES. BY	DRAFTED BY	
TR	SM	KD	BRIDGE ENGINEER

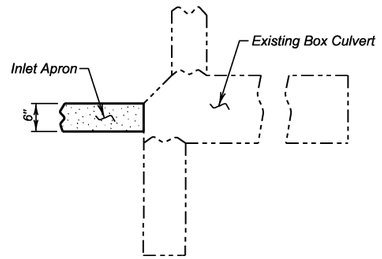
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P1806(23)168	E5	E5



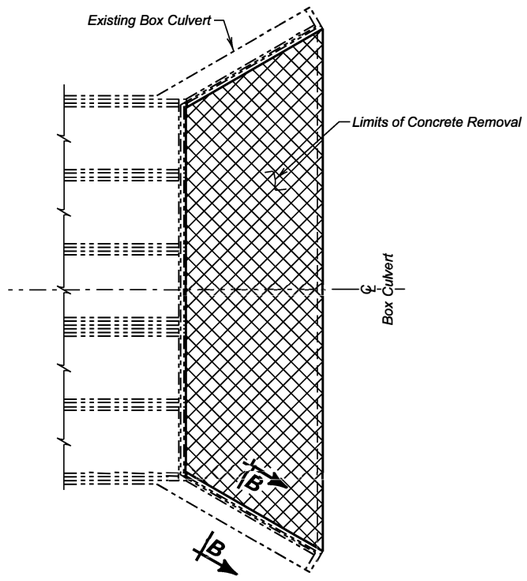
PLAN
(Inlet Apron)



SECTION A - A



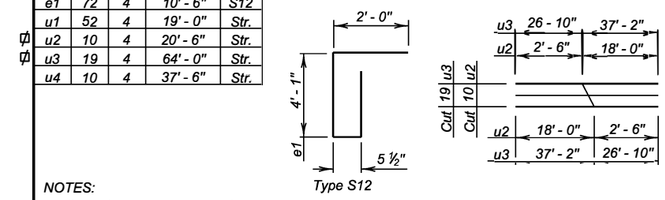
SECTION B - B



PLAN - BREAKOUT DETAILS

REINFORCING SCHEDULE

Mk.	No.	Size	Length	Type	Bending Details
e1	72	4	10' - 6"	S12	
u1	52	4	19' - 0"	Str.	
u2	10	4	20' - 6"	Str.	
u3	19	4	64' - 0"	Str.	
u4	10	4	37' - 6"	Str.	



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

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY
Class A45 Concrete, Box Culvert	Cu. Yd.	31.3
Reinforcing Steel	Lb.	2365
Structure Excavation, Box Culvert	Cu. Yd.	31
Breakout Structural Concrete	Cu. Yd.	28.2

SPECIFICATIONS

1. Design Specifications: AASHTO LRFD Bridge Design Specifications, 8th 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. 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.

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.

NOTES AND INLET APRON REPAIR
FOR
SPECIAL 5 - 10' X 6' BOX CULVERT
OVER CHANTIER CREEK — 0° SKEW
MRM 211.43 — SEC. 35-T7N-R28E
1806-368
STANLEY COUNTY
S. D. DEPT. OF TRANSPORTATION
APRIL 2020

DESIGNED BY	CK. DES. BY	DRAFTED BY	
HE	DM	BT	Steve A Johnson BRIDGE ENGINEER
STANI5UV	I5UVTA01		