04-26-2024 LETTING ITEM 148

0

0

0

0

# STATE OF ILLINOIS

DEPARTMENT OF TRANSPORTATION

109CR 1:102CR 1

D-99-033-23

FOR INDEX OF SHEETS, SEE SHEET NO. 3 FOR SUMMARY OF QUANTITIES, SEE SHEET NO. 4-6

# **PROPOSED HIGHWAY PLANS**

FAP ROUTE 328 (US 45) & FAP ROUTE 776 (IL 242) **SECTION 109CR-1;102CR-1** PROJECT HBFP-KCU7(326) **CULVERT REPLACEMENT** 

# SN 097-7066 : 2023 ADT = 1,730 WITH 20.52% TRUCKS

SN 033-7020 : 2023 ADT = 1.280 WITH 16.41% TRUCKS

# **TOWNSHIPS**

DESIGN DESIGNATION: N/A

COORDINATE SYSTEM : STATE PLANE ZONE - ILLINOIS EAST

**POSTED SPEED: 55 MPH** 

JOINT UTILITY LOCATION INFORMATION FOR EXCAVATION

PROJECT ENGINEER EHREN KIRBY PROJECT DESIGNER DEREK SNIDER

SN 097-7066(E)

WHITE COUNTY

GROSS LENGTH = 50.5 FT. = 0.0096 MILES NET LENGTH = 50.5 FT. = 0.0096 MILES

**HAMILTON COUNTY** 

WHITE & HAMILTON COUNTY C-99-046-23 R8W R6E

> STATE OF ILLINOIS **DEPARTMENT OF TRANSPORTATION** SUBMITTED REGION FIVE ENGINEER March 22, 2024 ENGINEER OF DESIGN AND ENVIRONMENT March 22, 2024

LOCATION OF SECTION INDICATED THUS: -

PRINTED BY THE AUTHORITY OF THE STATE OF ILLINOIS

REV. - MS

**CONTRACT NO. 78999** 

Prepared By:

DISTRICT STUDIES & PLANS ENGINEER

Examined By: Namey

Examined By: Carrie Nelson

DISTRICT PROGRAM DEVELOPMENT ENGINEER

Examined By:

DISTRICT OPERATIONS ENGINEER

Examined By:

DISTRICT PROJECT IMPLEMENTATION ENGINEER

Examined By:

DISTRICT CONSTRUCTION ENGINEER

Examined By: Aantar

DESIGNED . REVISED JSER NAME = derek snider DRAWN REVISED CHECKED REVISED

STATE OF ILLINOIS **DEPARTMENT OF TRANSPORTATION**  SIGNATURE SHEET OF SHEETS STA.

109CR-16-102CR-1 CONTRACT NO. 78999

### **INDEX OF SHEETS**

1 COVER SHEET
2 SIGNATURES
3 GENERAL NOTES, INDEX OF SHEETS, AND STANDARDS
4-6 SUMMARY OF QUANTITIES
7 SCHEDULES
8-10 SN 097-7066 BOX CULVERT REPLACEMENT
11-13 SN 033-7020 BOX CULVERT REPLACEMENT
14-17 PRECAST CONCRETE END SECTION DETAILS
18 DISTRICT STANDARDS
19-20 DETOUR SIGNING SHEETS

#### **STANDARDS**

000001-08	STANDARD SYMBOLS, ABBREVIATIONS AND PATTERNS
001001-02	AREAS OF REINFORCEMENT BARS
001006	DECIMAL OF AN INCH AND OF A FOOT
280001-07	TEMPORARY EROSION CONTROL SYSTEMS
420001-10	PAVEMENT JOINTS
420101-07	24' JOINTED PCC PAVEMENT
420701-03	PAVEMENT WELDED WIRE REINFORCEMENT
483001-06	PCC SHOULDER
701001-02	OFF ROAD OPERATIONS, 2L, 2W, MORE THAN 15' (4.5M) AWAY
701006-05	OFF ROAD OPERATIONS, 2L, 2W, 15' (4.5M) TO 24" (600MM) FROM PAVEMENT EDGE
701201-05	LANE CLOSURE, 2L,2W DAY ONLY, FOR SPEEDS > 45 MPH
701301-04	LANE CLOSURE, 2L,2W DAY ONLY, SHORT TIME OPERATIONS
701901-09	TRAFFIC CONTROL DEVICES
780001-05	TYPICAL PAVEMENT MARKINGS
BLR21-9	TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES FOR CONSTRUCTION ON RUAL LOCAL HIGHWAYS

## **GENERAL NOTES**

FACTORS USED FOR ESTIMATING PLAN QUANTITIES ARE AS FOLLOWS AND SHALL NOT BE USED FOR THE BASIS OF FINAL QUANTITIES:

ALL AGGREGATE

2.05 TONS/CU YD

RIPRAP

1.50 TONS/CU YD

AT ALL LOCATIONS WHERE THE PROPOSED HOT MIX ASPHALT OR CONCRETE PAVEMENT JOINS AN EXISTING HOT MIX ASPHALT OR CONCRETE PAVEMENT, A FULL DEPTH SAWED JOINT SHALL BE CONSTRUCTED. THE COST OF THIS JOINT WILL BE INCLUDED IN THE COST OF THE TYPE OF PAVEMENT BEING CONSTRUCTED.

REMOVAL OF EXISTING AGGREGATE SHOULDERS SHALL BE INCLUDED IN COST OF EARTH EXCAVATION.

COMMITMENTS: NONE

USER NAME = derek.snider	DESIGNED -	REVISED -				F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEET SHEET NO.			
	DRAWN -	REVISED -	STATE OF ILLINOIS	I IND	INDEX OF SHEETS, GENERAL NOTES, STANDARDS		*	109CR-1;102CR-1	**	20 3		
PLOT SCALE = 0.16666633 ' / in.	CHECKED -	REVISED -	DEPARTMENT OF TRANSPORTATION							<u> </u>	CONTRAC	T NO. 78999
PLOT DATE = 1/31/2024	DATE -	REVISED -		SCALE:	SHEET	OF	SHEETS STA.	TO STA.		LLINOIS FED. A	NID PROJECT	

COUNTY:	WHITE CO	HAMILTON CO
ROUTE:	FAP 328	FAP 776
FUNDING:	80% FEDERAL 20% STATE	80% FEDERAL 20% STATE
LOCATION:	RURAL	RURAL
TOTAL	SN 097-7097	SN 033-7040
OHANTITY	0004	0004

			TONDING.	00% FEDERAL 20% STATE	60% FEDERAL 20% STATE
			LOCATION:	RURAL	RURAL
CODE	ITEM DECEDIDATION	LINIT	TOTAL	SN 097-7097	SN 033-7040
NUMBER	ITEM DESCRIPTION	UNIT	QUANTITY	0004	0004
		i i			
20200100	EARTH EXCAVATION	CU YD	120	70	50
20700220	POROUS GRANULAR EMBANKMENT	CU YD	106	64	42
25000200	SEEDING, CLASS 2	ACRE	0.02	0.01	0.01
25000350	SEEDING, CLASS 7	ACRE	0.02	0.01	0.01
25000400	NITROGEN FERTILIZER NUTRIENT	POUND	1.8	0.9	0.9
25000500	PHOSPHORUS FERTILIZER NUTRIENT	POUND	1.8	0.9	0.9
25000600	POTASSIUM FERTILIZER NUTRIENT	POUND	1.8	0.9	0.9
25000700	AGRICULTURAL GROUND LIMESTONE	TON	0.04	0.02	0.02
25100630	EROSION CONTROL BLANKET	SQ YD	59	32	27
28000250	TEMPORARY EROSION CONTROL SEEDING	POUND	2	1	1
		ĺ			
28000400	PERIMETER EROSION BARRIER	FOOT	192	87	105
28100107	STONE RIPRAP, CLASS A4	SQ YD	57	11	46
-					
28200200	FILTER FABRIC	SQ YD	57	11	46
					1
	I.	: di	I.		

USER NAME = derek.snider	DESIGNED (1)	REVISED -							F.A. RTE	SECTION	COUNTY	TOTAL SHEET			
	DRAWN -	REVISED -		SUMMARY OF QUANTITIES				109CR-1&102CR-1	**	20 4					
PLOT SCALE = 0.16666633 ' / in.	CHECKED	REVISED -	DEPARTMENT OF TRANSPORTATION						·					CONTRAC	CT NO.78999
PLOT DATE = 2/2/2024	DATE	REVISED =		SCALE:	SHEET	OF 26	SHEETS	STA.	TO STA.		ILLINOIS FED. A	ID PROJECT			

COUNTY:	WHITE CO	HAMILTON CO
ROUTE:	FAP 328	FAP 776
FUNDING:	80% FEDERAL 20% STATE	80% FEDERAL 20% STATE
LOCATION:	RURAL	RURAL
ΤΩΤΔΙ	SN 097-7097	SN 033-7040

			FUNDING.	50% I EDERAL 20% STATE	00% I LDERAL 20% STATE
			LOCATION:	RURAL	RURAL
CODE	ITEM DESCRIPTION	UNIT	TOTAL	SN 097-7097	SN 033-7040
NUMBER	TIEM DESCRIPTION	UNII	QUANTITY	0004	0004
42000060	WELDED WIRE REINFORCEMENT	SQ YD	172	73	99
		25			
42000500	PORTLAND CEMENT CONCRETE PAVEMENT 10"	SQ YD	172	73	99
,					
44000100	PAVEMENT REMOVAL	SQ YD	172	73	99
48300500	PORTLAND CEMENT CONCRETE SHOULDERS 10"	SQ YD	49	20	29
40300300	TOTAL WE CELLENT CONCINETE SHOULDERS 10	34 10	75	20	2.5
50100300	REMOVAL OF EXISTING STRUCTURES NO. 1	EACH	1	1	
5.					
50100400	REMOVAL OF EXISTING STRUCTURES NO. 2	EACH	1		1
50200450	REMOVAL AND DISPOSAL OF UNSUITABLE MATERIAL FOR STRUCTURES	CU YD	108	40	68
54001001	BOX CULVERT END SECTIONS, CULVERT NO. 1	EACH	2	2	
54001002	BOX CULVERT END SECTIONS, CULVERT NO. 2	EACH	2		2
5.404.0502		5007	200		
54010603	PRECAST CONCRETE BOX CULVERTS 6' X 3'	FOOT	36	36	
54010802	PRECAST CONCRETE BOX CULVERTS 8' X 2'	FOOT	66		66
59100100	GEOCOMPOSITE WALL DRAIN	SQ YD	120	41	79
12.					
67100100	MOBILIZATION	L SUM	1	0.5	0.5
70100450	TRAFFIC CONTROL AND PROTECTION, STANDARD 701201	L SUM	1	0.5	0.5

USER NAME = GEFER.SHIGEF	DRAWN -	REVISED -	STATE OF ILLINOIS
PLOT SCALE = 0.16666633 ' / in	CHECKED 🖘	REVISED ==	DEPARTMENT OF TRANSPORT
PLOT DATE = 2/2/2024	DATE	REVISED -	

				FUNDING:	80% FEDERAL 20% STATE	80% FEDERAL 20% STATE
176				LOCATION:	RURAL	RURAL
	CODE	ITEM DESCRIPTION	UNIT	TOTAL	SN 097-7097	SN 033-7040
	NUMBER	TIEM DESCRIPTION	UNII	QUANTITY	0004	0004
	70107025	CHANGEABLE MESSAGE SIGN	CAL DA	84	42	42
*	78001110	PAINT PAVEMENT MARKING - LINE 4"	FOOT	138	60	78
T	70001110	TAINT TAVEMENT MARKING - LINE 4	1001	130	00	70
	X5810103	MEMBRANE WATERPROOFING SYSTEM FOR BURIED STRUCTURES	SQ YD	120	41	79
	X7011800	TRAFFIC CONTROL AND PROTECTION, STANDARD BLR 21	L SUM	1	0.5	0.5
	Z0016702	DETOUR SIGNING	L SUM	1	0.5	0.5
*	Z0054517	ROCK FILL - FOUNDATION	TON	219	81	138
				S		
	<u>-</u> 					

\* SPECIALTY ITEM

USER NAME = derek.snider	DESIGNED :-	REVISED -								TOTAL SHEET
	DRAWN -	REVISED -	STATE OF ILLINOIS	SUMMARY OF QUANTITIES				109CR-1&102CR-1	**	20 6
PLOT SCALE = 0.16666633 ' / in.	CHECKED (*)	REVISED -	DEPARTMENT OF TRANSPORTATION							T NO. 78999
PLOT DATE = 2/2/2024	DATE	REVISED =		SCALE:	SHEET OF SHEETS STA.	TO STA.		ILLINOIS FED. AI	ID PROJECT	

				Р	AVEMENT MARKING SCHEDU	JLE						
						PAINT PAVEMENT MARKING - LINE 4"						
	S	IOITAT	V		NOTES	SOLID WHITE	YELLOW SKIP DASH					
						FOOT	FOOT					
WHIT	WHITE COUNTY SN 097-7097											
223 + 48.5	RT	ТО	223 + 73.5	RT		25						
223 + 48.5		ТО	223 + 73.5		ALONG CENTERLINE		10					
223 + 48.5	LT	ТО	223 + 73.5	LT		25						
			SUBTOTAL			60						
HAMILT	ои сс	YTNUC	SN 033-7040									
629 + 01	RT	ТО	629 + 35	RT		34						
629 + 01		ТО	629 + 35		ALONG CENTERLINE		10					
629 + 01	LT	ТО	629 + 35	LT		34						
			SUBTOTAL	78								
			GRAND TOTA	138								

			PAVEM	ENT SCHEDULE					
S	NOITAT	ı	PAVEMENT REMOVAL	PORTLAND CEMENT CONCRETE PAVEMENT, 10"	WELDED WIRE REINFORCEMENT	PORTLAND CEMENT CONCRETE SCHOULDERS, 10"			
			SQ YD	SQ YD	SQ YD				
WHITE COUNTY SN 097-7097									
223 + 48.5	ТО	223 + 73.5	73	73 73		20			
HAMILTON (	COUNTY	033-7040							
629 + 01	99 99 99 99 99		99	29					
GRA	AND TO	TAL	172	172	172	49			

JSER NAME = derek.snider DESIGNED -REVISED -DRAWN -REVISED -CHECKED -REVISED -PLOT DATE = 1/31/2024 DATE REVISED -

STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION

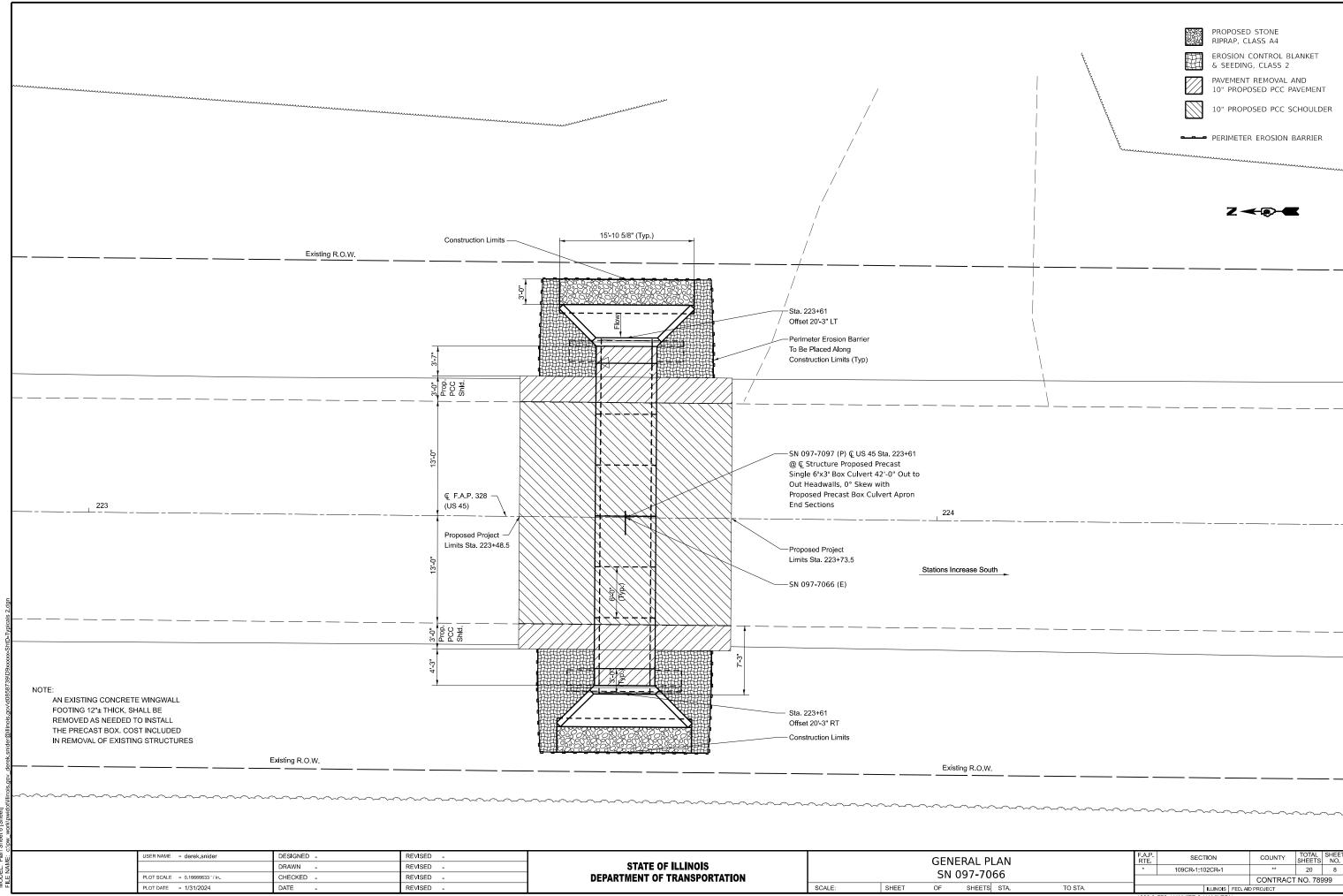
SCALE:

SECTION COUNTY SCHEDULES 109CR-1;102CR-1 CONTRACT NO. 78999 SHEET OF 26 SHEETS STA. TO STA.

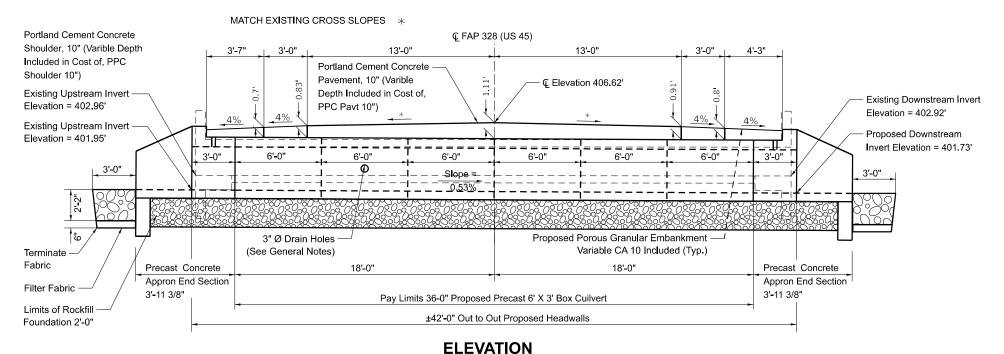
\*328 & 776 \*\* WHITE & HAMILTON

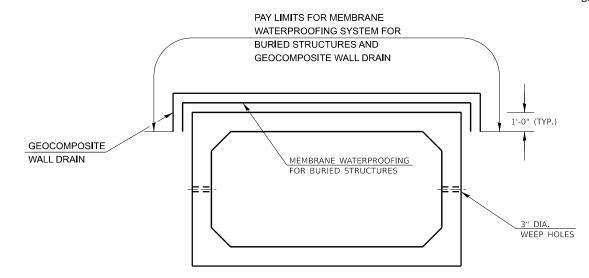
OUNTY TOTAL SHEET NO.

\*\* 20 7



#### FINAL SECTION





	PRECAST BOX CULVERT SCHEDULE (HL-93; ASTM C 1577)										
					DESIGN						
S	TATIO	N	SIZE	SKEW	EDGE OF SHLD. (MIN)	MAXIMUM	PGE BACKFILL REQUIRED				
WHIT	WHITE COUNTY										
223+48.5	223+48.5 TO 223+73.5		6′ X 3′	0°	± 0.583′	± 1.1′	64 CU YD				

## PRECAST CONCRETE **BOX CULVERT**

GEOCOMPOSITE WALL DRAIN SHALL BE ACCORDING TO SECTION 591 OF THE STANDARD SPECIFICATIONS, EXCEPT THAT CONCRETE NAILS SHALL NOT BE USED IN AREAS WHERE IT OVERLAPS MEMBRANE WATERPROOFING SYSTEM FOR BURIED STRUCTURES.

#### **GENERAL NOTES**

DRAIN HOLES SHALL BE PROVIDED ON EXTERIOR CULVERT WALLS FOR EACH PRECAST BOX SEGMENT WITH A CLEAR RISE GREATER THAN 3 FT. THE DRAIN HOLE SHALL BE LOCATED WITHIN 1/3 OF THE CLEAR RISE OF THE BOX CULVERT, SHALL NOT INTERCEPT THE HAUNCH, AND SHALL CONFORM TO THE REQUIREMENTS OF ARTICLE 503.11 OF THE STANDARD SPECIFICATIONS.

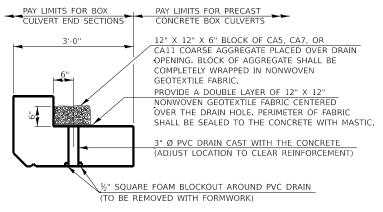
THE 6 IN. THICK LAYER OF POROUS GRANULAR MATERIAL REQUIRED FOR THE PRECAST CONCRETE BOX CULVERTPER ARTICLE 540.06 OF THE STANDARD SPECIFICATIONS SHALL ALSO APPLY TO THE CAST-IN-PLACE END SECTIONS. COST OF THE POROUS GRANULAR MATERIAL WILL NOT BE PAID SEPARATELY BUT SHALL BE INCLUDED IN THE UNIT PRICE OF THE WORK FOR WHICH IT IS REQUIRED.

NONWOVEN GEOTEXTILE FABRIC SHALL CONFORM TO THE REQUIREMENTS OF ARTICLE 1080.01 OF THE STANDARD SPECIFICATIONS. THE MINIMUM WEIGHT OF THE FABRIC SHALL BE 6 OUNCES PER SQUARE YARD.

THE REMOVAL OF THE EXISTING BOX CULVERT IS TO BE INCLUDED IN THE COST OF REMOVAL OF EXISTING STRUCTURES.

PRECAST CONCRETE BOX CULVERTS AND BOX CULVERT END SECTIONS SHALL BE BACKFILLED WITH POROUS GRANULAR EMBANKMENT IN THE REQUIRED EXCAVATION AREAS ON THE SIDES OF THE BOX CULVERT FROM THE BOTTOM OF THE PROPOSED PAVEMENT TO THE BOTTOM OF THE BOX CULVERT. THIS AREA OF PGE IS INCLUDED IN THE POROUS GRANULAR EMBANKMENT PAY ITEM. THE 6-INCH THICK LAYER OF POROUS GRANULAR MATERIAL REQUIRED UNDER THE PRECAST CONCRETE BOX CULVERT, ACCORDING TO SECTION 540.06 OF THE STANDARD SPECIFICATIONS, SHALL ALSO APPLY TO THE END SECTIONS. COST OF THIS POROUS GRANULAR MATERIAL WILL NOT BE PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE UNIT PRICE OF THE WORK FOR WHICH IT IS REQUIRED. THE PROPOSED REMOVAL AND DISPOSAL OF UNSUITABLE MATERIALS FOR STRUCTURES AND ROCK FILL - FOUNDATION PAYITEMS WILL INCLUDE QUANITITY FOR 2' BELOW THE INCIDENTAL 6-INCHES OF EXCAVATION AND POROUS GRANULAR MATERIAL.

THE LAST TWO PRECAST BARREL SECTIONS AT EACH END SHALL BE TIED TOGETHER USING CULVERT TIES AS SHOWN ON CULVERT TIE DETAILS SHEET. COST INCLUDED IN PRECAST CONCRETE BOX CULVERTS OF THE SIZE SPECIFIED IN THE PLANS.



#### DRAIN DETAIL

(ALL COSTS ASSOCIATED WITH FURNISHING AND CONSTRUCTING THE ABOVE DRAIN DETAIL WILL NOT BE MEASURED FOR PAYMENT BUT SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE FOR THE ASSOCIATED WORK.)

#### TOTAL BILL OF MATERIAL

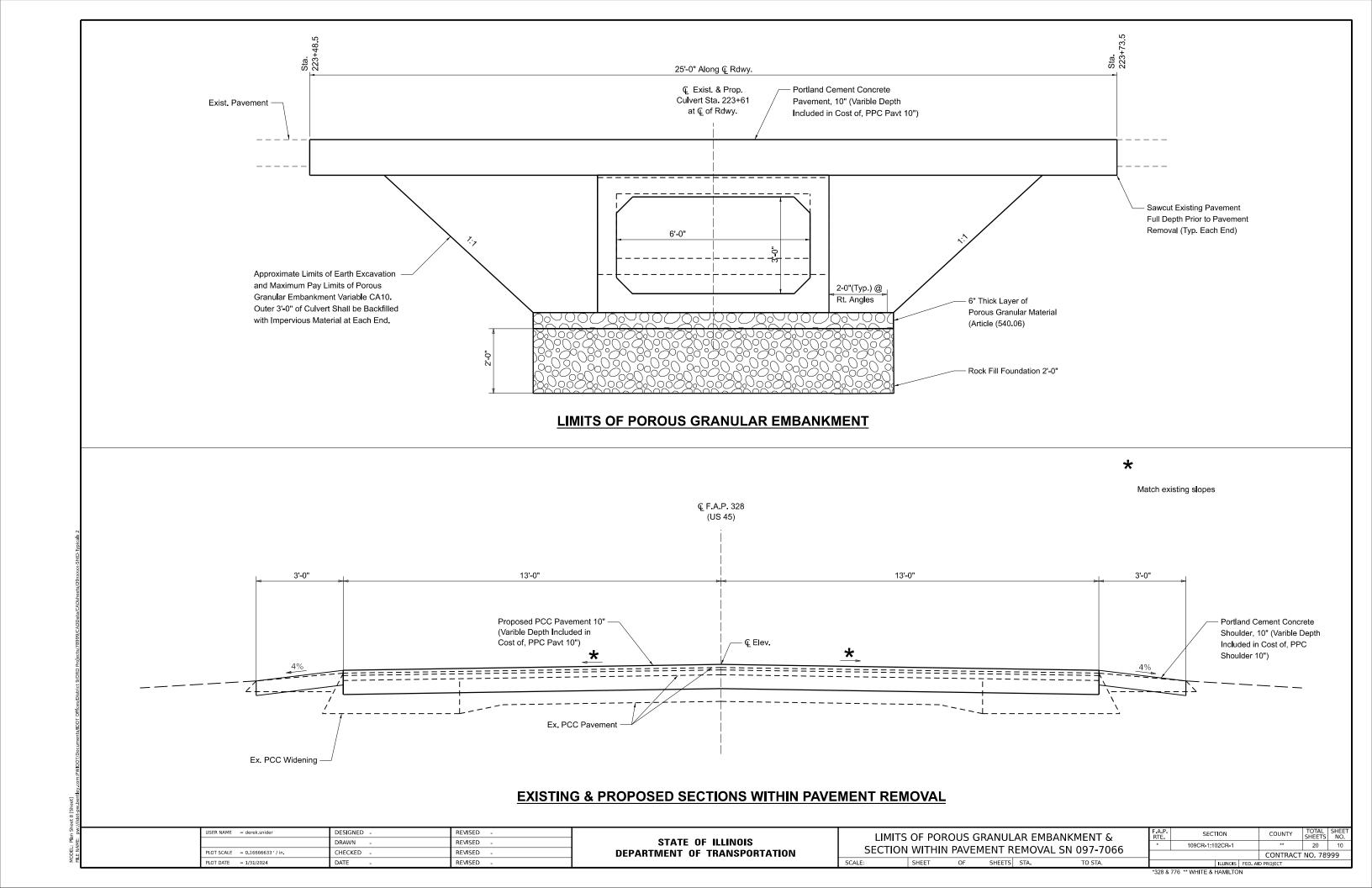
ITEM	UNIT	TOTAL
REMOVAL OF EXISTING STRUCTURES NO. 1	EACH	1
BOX CULVERT END SECTIONS, CULVERT NO. 1	EACH	2
PRECAST CONCRETE BOX CULVERTS 6' X 3'	FOOT	36
GEOCOMPOSITE WALL DRAIN	SQ YD	41
MEMBRANE WATERPROOFING SYSTEM FOR BURIED STRUCTRUES	SQ YD	41

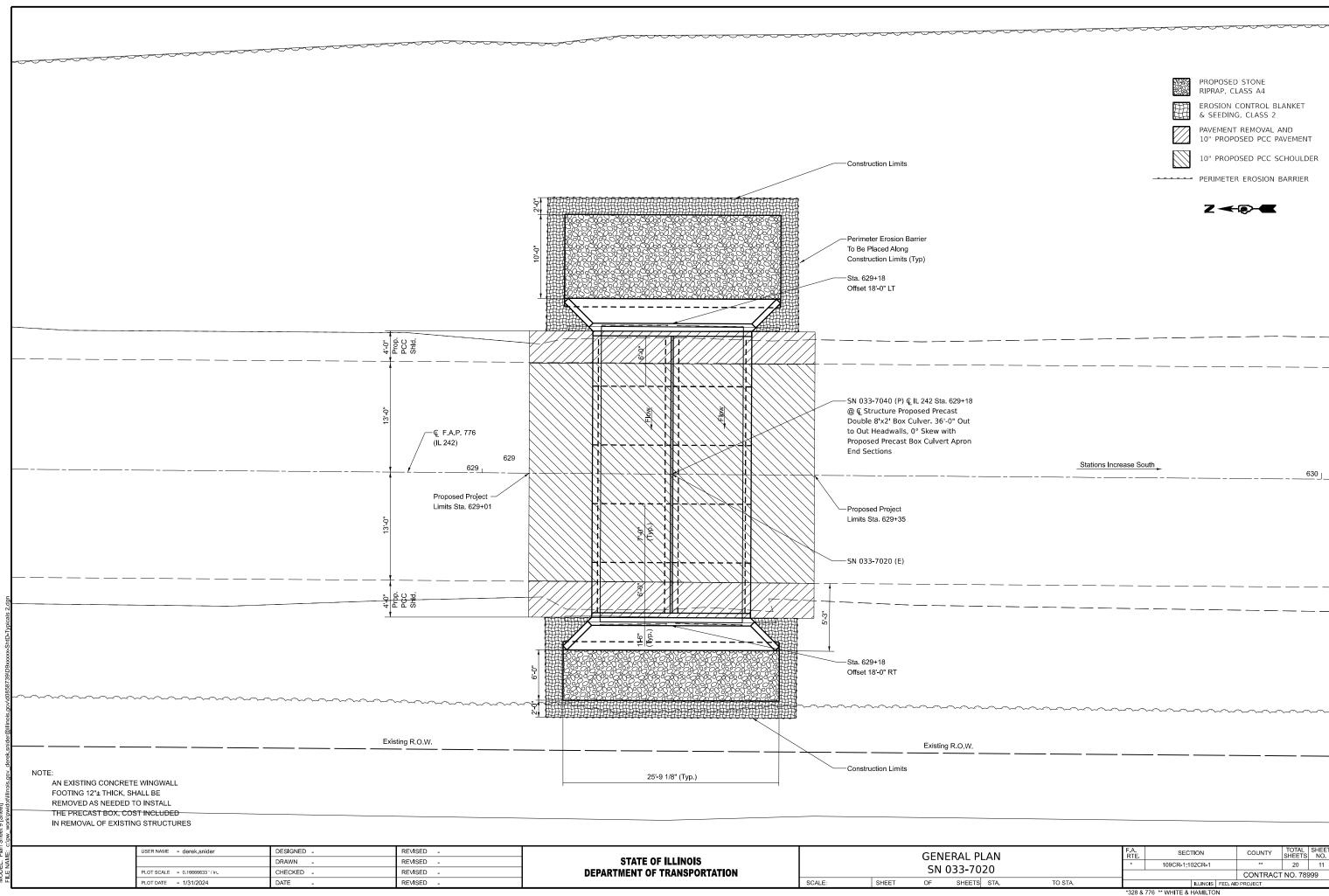
SER NAME = derek snider DESIGNED REVISED DRAWN REVISED PLOT SCALE = 0.16666633 ' / in CHECKED REVISED REVISED LOT DATE = 1/31/2024 DATE

STATE OF ILLINOIS **DEPARTMENT OF TRANSPORTATION** 

**ELEVATION & DETAILS** SN 097-7066 SHEET SHEETS STA TO STA.

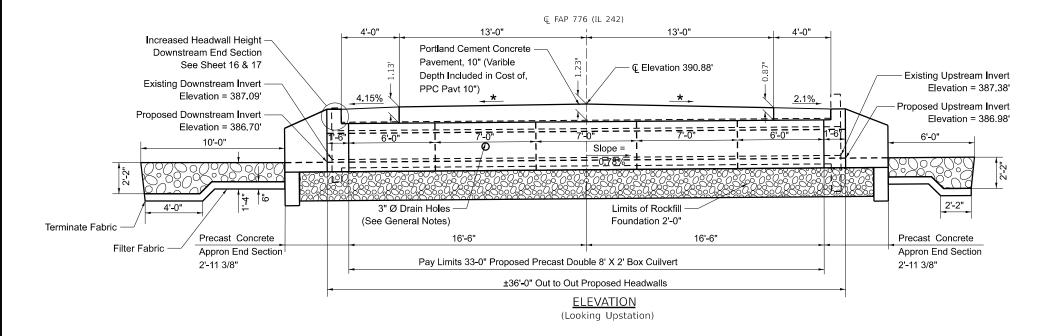
SECTION 109CR-1:102CR-1 20 CONTRACT NO. 78999

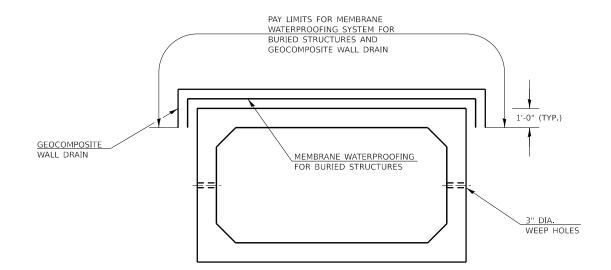




#### FINAL SECTION

#### \* MATCH EXISTING CROSS SLOPES

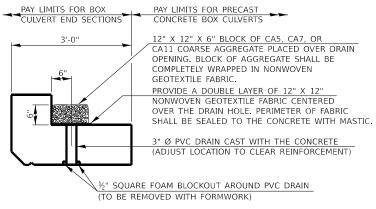




	PRECAST BOX CULVERT SCHEDULE (HL-93; ASTM C 1577)											
					DESIGN	FILL (FT.)						
S	TATIO	N	SIZE	SKEW			PGE BACKFILL REQUIRED					
HAMILT	HAMILTON COUNTY											
965 + 27	ТО	965 + 92	8′ X 2′	0°	± 0.87′	± 1.23′	42 CU YD					

### PRECAST CONCRETE **BOX CULVERT**

NOTE: GEOCOMPOSITE WALL DRAIN SHALL BE ACCORDING TO SECTION 591 OF THE STANDARD SPECIFICATIONS, EXCEPT THAT CONCRETE NAILS SHALL NOT BE USED IN AREAS WHERE IT OVERLAPS MEMBRANE WATERPROOFING SYSTEM FOR BURIED STRUCTURES.



(ALL COSTS ASSOCIATED WITH FURNISHING AND CONSTRUCTING THE ABOVE DRAIN DETAIL WILL NOT BE MEASURED FOR PAYMENT BUT SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE FOR THE ASSOCIATED WORK.)

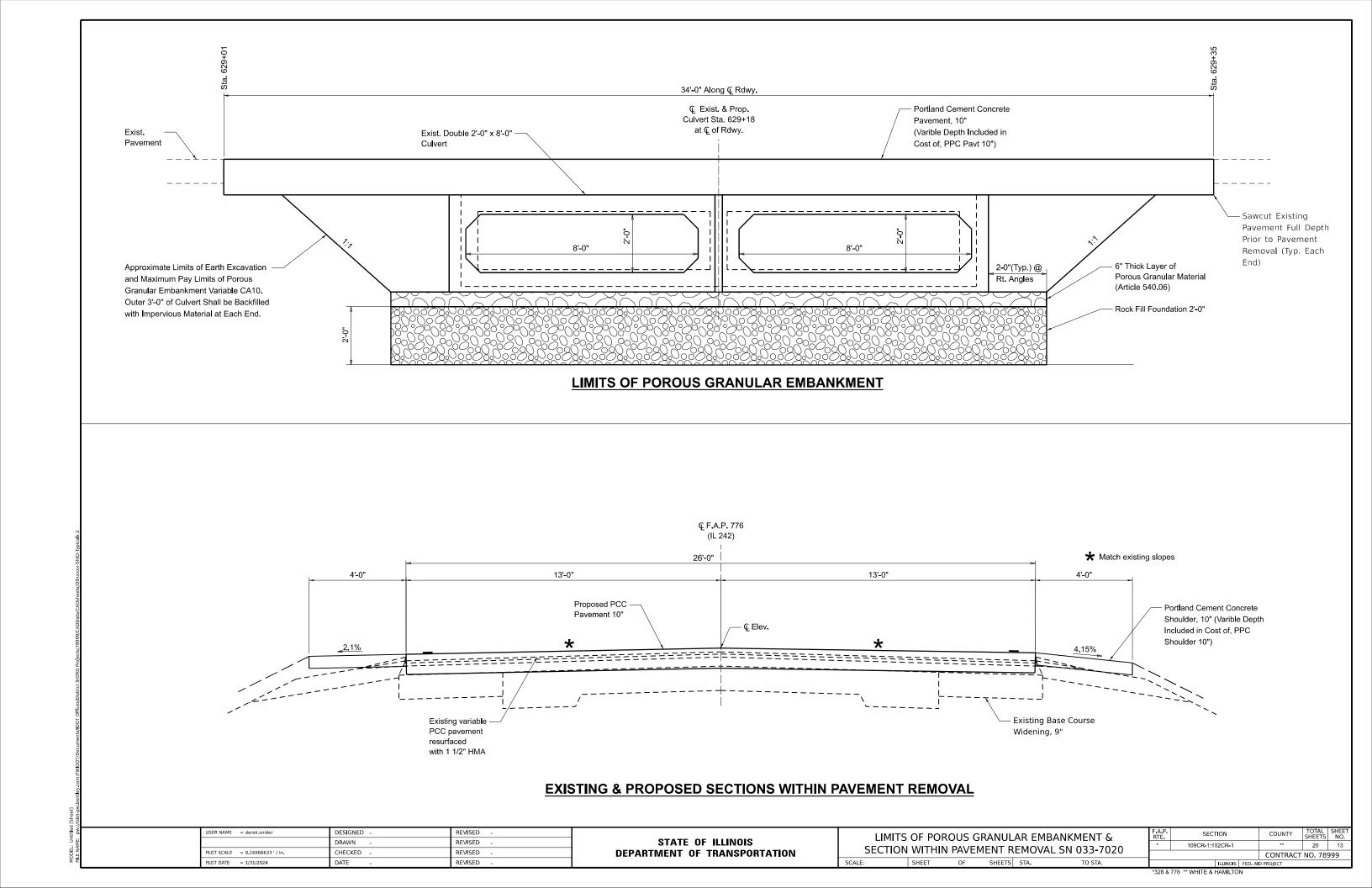
#### TOTAL BILL OF MATERIAL

ITEM	UNIT	TOTAL
REMOVAL OF EXISTING STRUCTURES NO 2	EACH	1
BOX CULVERT END SECTIONS, CULVERT NO. 2	EACH	2
PRECAST CONCRETE BOX CULVERTS 8' X 2'	FOOT	66
GEOCOMPOSITE WALL DRAIN	SQ YD	79
MEMBRANE WATERPROOFING SYSTEM FOR BURIED STRUCTRUES	SQ YD	79
<u> </u>		

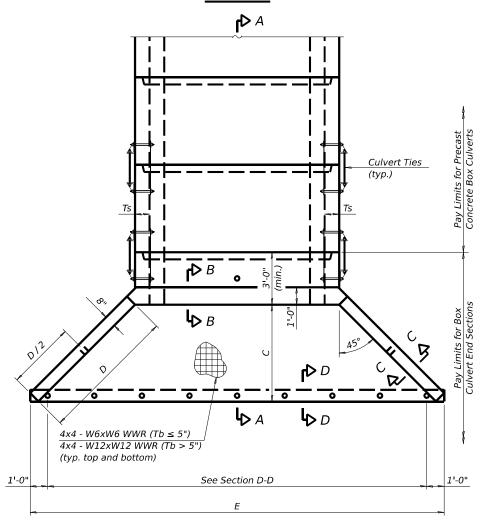
USER NAME = derek.snider	DESIGNED -	REVISED -
	DRAWN -	REVISED -
PLOT SCALE = 0.16666633 / in.	CHECKED -	REVISED -
PLOT DATE = 1/31/2024	DATE -	REVISED -

STATE O	F ILLINOIS					
DEPARTMENT OF	STATE OF ILLINOIS PARTMENT OF TRANSPORTATION					

	ELEVATION	ON & D	ETAILS		F.A.P. RTE.	SECTIO	V	COUNTY	TOTAL SHEETS	SHEET NO.
	CN (	033-70	20		*	109CR-1;102C	:R-1	**	20	12
	314 (	333-70	20					CONTRACT	NO. 78	999
HEET	OF	SHEETS	STA.	TO STA.		111	INOIS EED A	ID PROJECT		

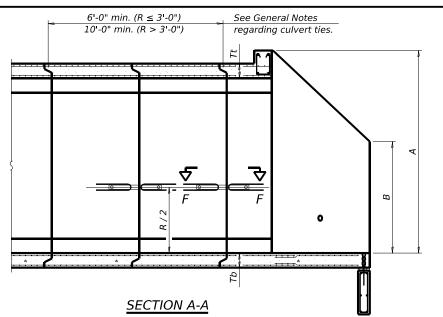


#### END VIEW



<u>PLAN</u>

SCB-AES 5-15-2023



### **GENERAL NOTES**

Box Culvert End Sections shall be constructed according to the requirements of Section 540 of the Standard Specifications except as modified herein. End sections will be paid for at the contract unit price per each for Box Culvert End Sections.

The Contractor may furnish the end section as a single precast concrete piece or construct the end section in the field using cast-in-place (CIP) construction. For CIP construction, the bottom slab thickness shall be ncreased by 2" and the clear cover to the bottom mat of reinforcement shall be increased to 3".

Box section dimensions, materials, and reinforcement details for Box Culvert End Sections shall be according to the requirements for ASTM C 1577 as required for the design of the portion of the culvert within the limits of Precast Concrete Box Culverts except as modified herein.

The number of culvert ties shall be sufficient to engage the minimum length of culvert barrel shown within the pay limits for Precast Concrete Box Culverts and will be dependent upon the length of box culvert segments furnished by the Contractor. Culvert ties are not required for box culverts having a rise (R) less than or equal to 3 ft and a span (S) greater than or equal to 10 ft.

All costs associated with furnishing and installing or constructing the toewall and culvert ties will not be measured for payment but shall be included in the unit price for Box Culvert End Sections of the culvert number specified.

Shop drawings that detail slab thickness and reinforcement layout for the Box Culvert End Sections shall be provided to the Engineer for review and approval. Reinforcement bars not detailed herein shall be detailed with a clear distance at the end of the reinforcement not less than  $\frac{1}{2}$ " nor more than 2". For the precast option, it shall be the Contractor's responsibility for determining a method of handling and a construction procedure shall be included on the shop drawings. The Contractor shall determine and detail in the shop drawings any necessary strengthening or stiffening provisions necessary to handle the precast segment. Any required modifications shall be at no extra charge.

The Contractor may use reinforcement bars in lieu of welded wire reinforcement (WWR). Reinforcement bars shall be limited to the sizes of #3 through #5 bars, a maximum spacing of the lesser of 8" or the member thickness, and shall result in an area of reinforcement equal to or greater than that provided by the WWR. Minimum lap lengths detailed herein are applicable to WWR and reinforcement bars.

Reinforcement (circumferential and longitudinal) in the culvert barrel portion of the end section being lapped with reinforcement from the wingwalls or bottom slab of the end section shall not be less than that required by ASTM C 1577 for the design fill height or the reinforcement detailed for the end section, whichever is greater.

One drain hole shall be provided in each wingwall for end sections of box culverts having an opening with a clear rise greater than 3 ft. The drain hole shall be located within the lower 1/3 of the clear rise of the box culvert and shall conform to the requirements of Article 503.11 of the Standard Specifications.

### APRON END SECTION DIMENSIONS

Span	Rise	Tt	Tb	Ts	Α	В	С	D	Е	Concrete	
(5)	(R)									Cu. Yd.	Required
3'-0"	2'-0"	7"	6"	4"	3'-4"	2'-2"	2'-105/8"	4'-1"	10'-45/8"	2.8	Yes
3'-0"	2'-0"	4"	4"	4"	3'-1"	2'-1"	2'-7%"	3'-9"	9'-11"	2.3	Yes
3'-0"	3'-0"	7"	6"	4"	4'-4"	2'-8"	3'-105/8"	5'-6"	12-45/8"	3.7	Yes
3'-0"	3'-0"	4"	4"	4"	4'-1"	2'-7"	3'-7%"	5'-2"	11'-11"	3.1	Yes
4'-0"	2'-0"	7.5"	6"	5"	3'-4½"	2'-2½"	2'-11%"	4'-2"	11'-8"	3.3	Yes
4'-0"	2'-0"	5"	5"	5"	3'-2"	2'-1"	2'-8½"	3'-10"	11'-23/8"	2.8	Yes
4'-0"	3'-0"	7.5"	6"	5"	4'-4½"	2'-8½"	3'-11 <sup>3</sup> / <sub>8</sub> "	5'-7"	13'-81/8"	4.2	Yes
4'-0"	3'-0"	5"	5"	5"	4'-2"	2'-7"	3'-8½"	5'-3"	13'-2 <sup>3</sup> / <sub>8</sub> "	3.7	Yes
4'-0"	4'-0"	7.5"	6"	5"	5'-4½"	3'-2½"	4'-11 <sup>3</sup> / <sub>8</sub> "	7'-0"	15'-8 <sup>1</sup> / <sub>8</sub> "	5.3	Yes
4'-0"	4'-0"	5"	5"	5"	5'-2"	3'-1"	4'-85/8"	6'-8"	15'-2 <sup>1</sup> / <sub>2</sub> "	4.7	Yes
5'-0"	2'-0"	8"	7"	6"	3'-5"	2'-3"	2'-11%"	4'-2"	12'-10"	3.9	Yes
5'-0"	2'-0"	6"	6"	6"	3'-3"	2'-2"	2'-10"	<b>4'</b> -0"	12'-71/4"	3.5	Yes
5'-0"	3'-0"	8"	7"	6"	4'-5"	2'-9"	3'-11¾	5'-7"	14'-10 <sup>1</sup> /8"	4.9	Yes
5'-0"	3'-0"	6"	6"	6"	4'-3"	2'-8"	3'-10"	5'-5"	14'-71/4"	4.5	Yes
5'-0"	4'-0"	8"	7"	6"	5'-5"	3'-3"	4'-11 <sup>3</sup> / <sub>8</sub> "	7'-0"	16'-10 <sup>1</sup> / <sub>8</sub> "	6.1	Yes
5'-0"	4'-0"	6"	6"	6"	5'-3"	3'-2"	4'-9 <sup>1</sup> ⁄ <sub>4</sub> "	6 <b>'</b> -9"	16'-5 <sup>7</sup> / <sub>8</sub> "	5.5	Yes
5'-0"	5'-0"	8"	7"	6"	6'-5"	3'-9"	5'-11 <sup>3</sup> ⁄8"	8'-5"	18'-10 <sup>1</sup> / <sub>8</sub> "	7.4	Yes
5'-0"	5'-0"	6"	6"	6"	6'-3"	3'-8"	5'-9 <sup>1</sup> / <sub>4</sub> "	8'-2"	18'-5%"	6.8	Yes
6'-0"	2'-0"	8"	7"	7"	3'-5"	2'-3"	2'-11%"	4'-2"	14'-0"	4.3	Yes
6'-0"	2'-0"	<i>7</i> "	7"	7"	3'-4"	2'-2"	2'-105/8"	4'-1"	13'-10 <sup>5</sup> /8"	4.2	Yes
6'-0"	3'-0"	8"	7"	7"	4'-5"	2'-9"	3'-113/8"	5'-7"	16'-01/8"	5.4	Yes
6'-0"	3'-0"	7"	7"	7"	4'-4"	2'-8"	3'-105/8"	5'-6"	15'-105/8"	5.2	Yes
6'-0"	4'-0"	8"	7"	7"	5'-5"	3'-3"	4'-113/8"	7'-0"	18'-01/8"	6.5	Yes
6'-0"	4'-0"	<i>7</i> "	7"	7"	5'-4"	3'-2"	4'-103/4"	6'-11"	17'-10¾"	6.5	Yes
6'-0"	5'-0"	8"	7"	7"	6'-5"	3'-9"	5'-11%"	8'-5"	20'-01/8"	8.0	Yes
6'-0"	5'-0"	7"	7"	7"	6'-4"	3'-8"	5'-103/4"	8'-4"	19'-103/4"	7.8	Yes
6'-0"	6'-0"	8"	7"	7"	7'-5"	4'-3"	6'-11½"	9'-10"	22'-01/4"	9.5	Yes
6'-0"	6'-0"	7"	7"	7"	7'-4"	4'-2"	6'-10 <sup>3</sup> / <sub>4</sub> "	9'-9"	21'-103/4"	9.3	Yes
7'-0"	2'-0"	8"	8"	8"	3'-5"	2'-3"	2'-113/8"	4'-2"	15'-2"	4.9	Yes
7'-0"	3'-0"	8"	8"	8"	4'-5"	2'-9"	3'-113/8"	5'-7"	17'-21/8"	6.1	Yes
7'-0"	4'-0"	8"	8"	8"	5'-5"	3'-3"	4'-113/8"	7'-0"	19'-21/8"	7.4	Yes
7'-0"	5'-0"	8"	8"	8"	6'-5"	3'-9"	5'-113/8"	8'-5"	21'-21/8"	8.9	Yes
7'-0"	6'-0"	8"	8"	8"	7'-5"	4'-3"	6'-11½"	9'-10"	23'-21/4"	10.6	Yes
8'-0"	2'-0"	8"	8"	8"	3'-5"	2'-3"	2'-113/8"	4'-2"	16'-2"	5.3	Yes
8'-0"	3'-0"	8"	8"	8"	4'-5"	2'-9"	3'-113/8"	5'-7"	18'-21/8"	6.5	Yes
8'-0"	4'-0"	8"	8"	8"	5'-5"	3'-3"	4'-11 <sup>3</sup> / <sub>8</sub> "	7'-0"	20'-21/8"	7.8	Yes
8'-0"	5'-0"	8"	8"	8"	6'-5"	3'-9"	5'-11 <sup>3</sup> / <sub>8</sub> "	8'-5"	22'-21/8"	9.3	Yes
8'-0"	6'-0"	8"	8"	8"	7'-5"	4'-3"	6'-11 <sup>1</sup> / <sub>2</sub> "	9'-10"	24'-21/4"	11.0	Yes
9'-0"	2'-0"	9"	9"	9"	3'-6"	2'-3"	3'-03/4"	4'-4"	17'-67/8"	6.2	Yes
9'-0"	3'-0"	9"	9"	9"	4'-6"	2'-9"	4'-03/4"	5'-9"	19'-67/8"	7.5	Yes
9'-0"	4'-0"	9'	9"	9"	5'-6"	3'-3"	5'-0 <sup>3</sup> / <sub>4</sub> "	7'-2"	21'-67/8"	9.0	Yes
9'-0"	5'-0"	9"	9"	9"	6'-6"	3'-9"	6'-0 <sup>7</sup> / <sub>8</sub> "	7 -2 8¹-7"	23'-7"	10.6	Yes
9'-0"	6'-0"	9"	9"	9"	7'-6"	3 -9 4'-3"	7'-0 <sup>1</sup> / <sub>8</sub> "	9'-11"	25'-5 <sup>5</sup> / <sub>8</sub> "	12.4	Yes
10'-0"	2'-0"	10"	10"	10"	3'-7"	2'-4"	7'-0 <sup>4</sup> 8" 3'-1 <sup>1</sup> /2"	9'-11" 4'-5"	25'-5%" 18'-10 <sup>1</sup> / <sub>4</sub> "		No
10'-0"	3'-0"	10"	10"	10"	3'-7" 4'-7"					7.1	No
	4'-0"	10"			5'-7"	2'-10" 3'-4"	4'-1½"	5'-10" 7'-3"	20'-10 <sup>1</sup> / <sub>4</sub> "	8.6	
10'-0"			10"	10"			5'-1½"		22'-103/"	10.2	Yes
	5'-0"	10"	10"	10"	6'-7"	3'-10"	6'-1½"	8'-8"	24'-103/8"	12.0	Yes
10'-0"	6'-0"	10"	10"	10"	7'-7"	4'-4"	7'-1½"	10'-1"	26'-103/8"	13.9	Yes
11'-0"	2'-0"	11"	11"	11"	3'-8"	2'-4"	3'-2 <sup>7</sup> / <sub>8</sub> "	4'-7"	20'-31/8"	8.2	No
11'-0"	3'-0"	11"	11"	11"	4'-8"	2'-10"	4'-27/8"	6'-0"	22'-31/8"	9.8	No
11'-0"	4'-0"	11"	11"	11"	5'-8"	3'-4"	5'-21/4"	7'-4"	24'-1¾"	11.5	Yes
11'-0"	5'-0"	11"	11"	11"	6'-8"	3'-10"	6'-21/4"	8'-9"	26'-1¾"	13.3	Yes
11'-0"	6'-0"	11"	11"	11"	7'-8"	4'-4"	7'-21/4"	10'-2"	28'-17/8"	15.5	Yes
12'-0"	2'-0"	12"	12"	12"	3'-9"	2'-5"	3'-35%"	4'-8"	21'-6½"	9.3	No
12'-0"	3'-0"	12"	12"	12"	4'-9"	2'-11"	4'-35/8"	6'-1"	23'-6½"	11.1	No
12'-0"	4'-0"	12"	12"	12"	5'-9"	3'-5"	5'-3 <sup>5</sup> %"	7'-6"	25'-6 <sup>5</sup> / <sub>8</sub> "	13.0	Yes
12'-0"	5'-0"	12"	12"	12"	6'-9"	3'-11"	6'-3 <sup>5</sup> / <sub>8</sub> "	8'-11"	27'-6 <sup>5</sup> / <sub>8</sub> "	14.1	Yes
12'-0"	6'-0"	12"	12"	12"	7'-9"	4'-5"	7'-3 <sup>5</sup> %"	10'-4"	29'-6 <sup>5</sup> / <sub>8</sub> "	17.4	Yes
Note:											
Two	sets of a								ılvert sizes (		top

Two sets of apron end section dimensions are shown above for some box culvert sizes due to the top and bottom slabs having different thicknesses per ASTM C 1577 for design fill heights less than 2 ft.

(Sheet 1 of 2)

 USER NAME
 = derek.snider
 DESIGNED
 REVISED

 DRAWN
 REVISED

 PLOT SCALE
 = 0.16666633 ' / in.
 CHECKED
 REVISED

 PLOT DATE
 = 1/31/2024
 DATE
 REVISED

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

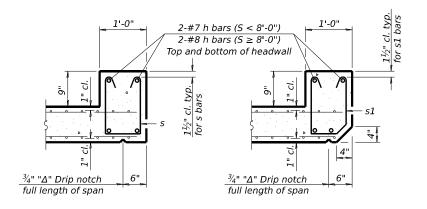
PRECAST CONCRETE BOX CULVERT
APRON END SECTION DETAILS SN 097-7066

SHEET OF SHEETS STA. TO STA.

A.P. SECTION COUNTY TOTAL SHEETS NO.

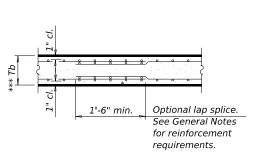
109CR-1;102CR-1 \* 20 14

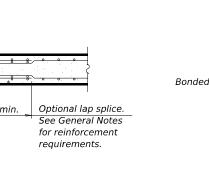
CONTRACT NO. 78999

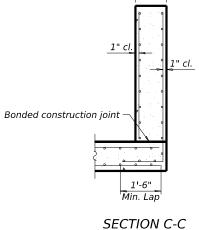


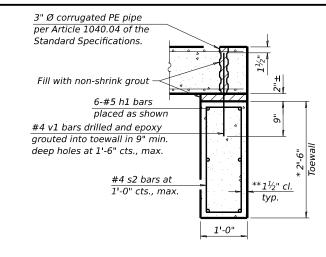


#### SECTION B-B (Top slab at upstream end)





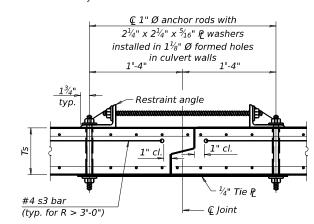




#### SECTION D-D

### SECTION B-B

\*\*\* This dimension shall be increased by 2" for CIP construction.



SECTION F-F (Showing culvert tie details)

## TOEWALL CONSTRUCTION SEQUENCE 1. Perform excavation and construct toewall. 2. Backfill accordingly and place bedding for precast box culvert end sections. 3. Set precast box culvert end section.

- 4. Drill and epoxy grout reinforcement in toewall in accordance with Section 584 of the Standard Specifications.
- 5. Pressure grout voids using non-shrink grout conforming to Section 1024 of the Standard Specifications.
- \* The Contractor may furnish a precast or cast-in-place toewall. The Contractor shall be responsible for the strength and stability of the precast toewall during handling. Additional lifting points may be required depending upon the length of the toewall or the Contractor may need to modify the design of the toewall for the proposed handling method.
- \*\* If soil conditions permit, the sides of the toewall may be poured directly against the soil. The clear cover on the sides of the toewall shall be increased to 3" by increasing the thickness of the toewall.

1" Ø anchor rods for the culvert ties shall conform to the requirements of ASTM F1554, Grade 105. Structural steel for the tie plate and restraint angle shall conform to the requirements of Article 1006.04 of the Standard Specifications. All components of the culvert tie detail shall be galvanized according to the requirements of AASHTO M 111 or M 232 as applicable.  $2\frac{1}{4}$ " $x2\frac{1}{4}$ " $x^{5}_{16}$ " plate washers shall be provided under each nut required for the anchor rods. Anchor rods connecting precast sections shall be brought to a snug tight

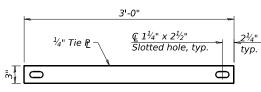
condition followed by an additional  $\frac{1}{2}$  turn on one of the nuts for anchor rods installed in

the walls. Match marks shall be provided on the bolt and nut to verify relative rotation between

the bolt and the nut. Holes in the walls for the culvert tie assembly may be drilled using core

## $C 1^{1/4}$ " Ø hole for 1" Ø ∠ 6" x 4" x ½" anchor rod with $\not\in 1^{1}\!\!/_{\!4}$ " Ø hole in $2\frac{1}{4}$ " x $2\frac{1}{4}$ " x $\frac{5}{16}$ " bottom leg of angle R washer

## RESTRAINT ANGLE DETAIL



TIE PLATE DETAIL

5-15-2023

(Sheet 2 of 2)

USER NAME = derek.snider	DESIGNED -	REVISED -	
	DRAWN -	REVISED -	
PLOT SCALE = 0.16666633 / in.	CHECKED -	REVISED -	
PLOT DATE = 1/31/2024	DATE -	REVISED -	

STATE OF ILLINOIS **DEPARTMENT OF TRANSPORTATION** 

PRECAST CONCRETE BOX CULVERT								
PRO	ON END	SECTION	ON DET	AILS	SN 097-7066			
	SHEET	OF	SHEETS	STA.	TO STA.			

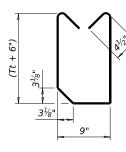
bits in lieu of using formed holes.

•	SECT	ΠON		COUNTY	TOTAL SHEETS	SHEET NO.
	109CR-1;1	02CR-1		**	20	15
				CONTRACT	NO. 789	999
_		ILLINOIS	FED. Al	D PROJECT		

\*328 & 776 \*\* WHITE & HAMILTON

#4 s or s1 bars at spacing = Tt (Spacing need not be less than 8") SECTION E-E

9"



BAR s1

BAR s2

BAR s3

9"

SCB-AES

BAR s

#### **GENERAL NOTES**

Box Culvert End Sections shall be constructed according to the requirements of Section 540 of the Standard Specifications except as modified herein. End sections will be paid for at the contract unit price per each for Box Culvert End Sections

Box section dimensions, materials, and reinforcement details for Box Culvert End Sections shall be according to the requirements for ASTM C 1577 as required for the design of the portion of the

culvert within the limits of Precast Concrete Box Culverts except as modified herein. Details for Double Cell Box Culvert shown. Details for Triple Cell Box Culvert similar.

The details contained herein are for constructing the end sections using cast-in-place (CIP) construction. The Contractor may propose to furnish the end sections using precast construction methods and the end sections may consist of multiple precast concrete segments. The Contractor shall be responsible for determining all details associated with the precast option including any strengthening or stiffening provisions necessary for handling the precast segments. Conceptual details followed by shop drawings and design calculations sealed by an Illinois Licensed Structural Engineer shall be submitted to the Engineer for review and approval. Elements of the precast option shall at a minimum result in the same wingwall geometry and not have a thickness less than that detailed herein. The option to construct the end sections using precast construction methods shall be at no additional charge.

Shop drawings that detail slab thickness and reinforcement layout for the Box Culvert End Sections shall be provided to the Engineer for review and approval. Reinforcement bars not detailed herein shall be detailed with a clear distance at the end of the reinforcement not less than  $\frac{1}{2}$ " nor more than 2".

The contractor may use reinforcement bars in lieu of welded wire reinforcement (WWR). Reinforcement bars shall be limited to the sizes of #3 through #5 bars, a maximum spacing of the lesser of 8" or the member thickness, and shall result in an area of reinforcement equal to or greater than that provided by the WWR. Minimum lap lengths detailed herein are applicable to WWR and reinforcement bars.

Reinforcement (circumferential and longitudinal) in the precast concrete box culvert segments immediately adjacent to the box culvert end sections that is being lapped with the end section reinforcement shall not be less than that required by ASTM C 1577 for the design fill height or the reinforcement detailed for the end section, whichever is greater.

One drain hole shall be provided in each wingwall for end sections of box culverts having an opening with a clear rise greater than 3 ft. The drain hole shall be located within 1/3 of the clear rise of the box culvert and shall conform to the requirements of Article 503.11 of the Standard Specifications.

#### APRON END SECTION DIMENSIONS

								Double	Cell	Triple Cell		
	Span (S)	Rise (R)	Tt , Tb , & Ts	Α	В	С	D	Е	Concrete Cu. Yd.	E	Concrete Cu. Yd.	
	7 <b>'</b> -0"	2'-0"	8"	3'-5"	2'-3"	2'-11%"	4'-2"	23'-9"	6.6			
	7'-0"	3'-0"	8"	4'-5"	2'-9"	3'-11 <sup>3</sup> ⁄8"	5'-7"	25'-9 <sup>1</sup> / <sub>8</sub> "	8.0			
	7'-0"	4'-0"	8"	5'-5"	3'-3"	4'-11 <sup>3</sup> / <sub>8</sub> "	7'-0"	27'-9 <sup>1</sup> / <sub>8</sub> "	9.5			
	7'-0"	5'-0"	8"	6'-5"	3'-9"	5'-11 <sup>3</sup> ⁄8"	8'-5"	29'- 9 <sup>1</sup> / <sub>8</sub> "	11.2			
	7'-0"	6'-0"	8"	7'-5"	4'-3"	6'-11½"	9'-10"	31'-91/4"	13.1	\		
*	8 <b>'</b> -0"	2'-0"	8"	3'-5"	2'-3"	2'-11%"	4'-2"	25'-9"	7.1	] /		
	8'-0"	3'-0"	8"	4'-5"	2'-9"	3'-11 <sup>3</sup> / <sub>8</sub> "	5'-7"	27'-91/8"	8.6			
	8'-0"	4'-0"	8"	5'-5"	3'-3"	4'-11 <sup>3</sup> /8"	7'-0"	29'-91/8"	10.2	/		
	8 <b>'</b> -0"	5'-0"	8"	6'-5"	3'-9"	5'-11 <sup>3</sup> ⁄8"	8'-5"	31'-91/8"	11.9	] /		
	8 <b>'</b> -0"	6'-0"	8"	7'-5"	4'-3"	6'-11½"	9'-10"	33'-91/4"	13.8	V		
	9'-0"	2'-0"	9"	3'-6"	2'-3"	3'-0 <sup>3</sup> / <sub>4</sub> "	4'-4"	28'-3%"	8.2	39'-0 <sup>7</sup> / <sub>8</sub> "	11.4	
	9'-0"	3'-0"	9"	4'-6"	2'-9"	4'-03/4"	5'-9"	30'-3 <sup>7</sup> / <sub>8</sub> "	9.7	41'-07/8"	13.3	
	9'-0"	4 <b>'</b> -0"	9"	5'-6"	3'-3"	5'-0 <sup>3</sup> / <sub>4</sub> "	7'-2"	32'-3 <sup>7</sup> / <sub>8</sub> "	11.4	43'-0 <sup>7</sup> / <sub>8</sub> "	15.4	
	9'-0"	5'-0"	9"	6'-6"	3'-9"	6'-0 <sup>7</sup> / <sub>8</sub> "	8'-7"	34'-4"	13.2	45'-1"	17.6	
	9'-0"	6'-0"	9"	7'-6"	4'-3"	7'-0½"	9'-11"	36¹-2 <sup>5</sup> ⁄8"	15.1	46'-11 <sup>5</sup> ⁄8"	19.8	
	10'-0"	2'-0"	10"	3'-7"	2'-4"	3'-1½"	4'-5"	30'-9 <sup>1</sup> / <sub>4</sub> "	9.2	42'-81/4"	13.0	
	10'-0"	3'-0"	10"	4'-7"	2'-10"	4'-1½"	5'-10"	32'-9 <sup>1</sup> / <sub>4</sub> "	10.8	44'-81/4"	15.0	
	10'-0"	4'-0"	10"	<i>5</i> '- <i>7</i> "	3'-4"	5'-1½"	7'-3"	34'-9 <sup>3</sup> / <sub>8</sub> "	12.6	46'-8 <sup>3</sup> / <sub>8</sub> "	17.2	
	10'-0"	5'-0"	10"	6'-7"	3'-10"	6'-1½"	8'-8"	36'-9 <sup>3</sup> / <sub>8</sub> "	14.5	48'-8 <sup>3</sup> / <sub>8</sub> "	19.5	
	10'-0"	6'-0"	10"	7'-7"	4'-4"	7'-1½"	10'-1"	38'-9 <sup>3</sup> / <sub>8</sub> "	16.6	50'-8 <sup>3</sup> / <sub>8</sub> "	22.0	
	11'-0"	2 <b>'</b> -0"	11"	3'-8"	2'-4"	3'-2 <sup>7</sup> / <sub>8</sub> "	4'-7"	33'-4 <sup>1</sup> / <sub>8</sub> "	10.4	46'-5 <sup>1</sup> / <sub>8</sub> "	14.7	
	11'-0"	3'-0"	11"	4'-8"	2'-10"	4'-2 <sup>7</sup> / <sub>8</sub> "	6'-0"	35'-4 <sup>1</sup> / <sub>8</sub> "	12.1	48'-5 <sup>1</sup> / <sub>8</sub> "	16.9	
	11'-0"	4'-0"	11"	5'-8"	3'-4"	5'-2 <sup>1</sup> / <sub>4</sub> "	7'-4"	37'-2 <sup>3</sup> / <sub>4</sub> "	13.9	50'-3 <sup>3</sup> / <sub>4</sub> "	19.1	
	11'-0"	5'-0"	11"	6'-8"	3'-10"	6'-2 <sup>1</sup> / <sub>4</sub> "	8'-9"	39'-2 <sup>7</sup> / <sub>8</sub> "	15.8	52'-3 <sup>7</sup> / <sub>8</sub> "	21.4	
	11'-0"	6'-0"	11"	<i>7</i> '-8"	4'-4"	7'-2 <sup>1</sup> / <sub>4</sub> "	10'-2"	41'-27/8"	18.1	54'-3 <sup>7</sup> / <sub>8</sub> "	24.2	
	12'-0"	2'-0"	12"	3'-9"	2'-5"	3'-3 <sup>5</sup> /8"	4'-8"	35'-9½"	11.6	50'-0 <sup>1</sup> / <sub>2</sub> "	16.5	
	12'-0"	3'-0"	12"	4'-9"	2'-11"	4'-3 <sup>5</sup> / <sub>8</sub> "	6'-1"	37'-9½"	13.4	52'-0 <sup>1</sup> / <sub>2</sub> "	18.8	
	12'-0"	4'-0"	12"	5'-9"	3'-5"	5'-3 <sup>5</sup> / <sub>8</sub> "	7'-6"	39'-9%"	15.4	54'-0 <sup>5</sup> / <sub>8</sub> "	21.2	
	12'-0"	5'-0"	12"	6'-9"	3'-11"	6'-3 <sup>5</sup> / <sub>8</sub> "	8'-11"	41'-9%"	17.6	56'-0 <sup>5</sup> %"	23.8	
	12'-0"	6 <b>'</b> -0"	12"	7'-9"	4'-5"	7'-3 <sup>5</sup> /8"	10'-4"	43'-9 <sup>5</sup> / <sub>8</sub> "	19.8	58'-0 <sup>5</sup> / <sub>8</sub> "	26.6	

3'-8" 2'-4 1/2" 2'-11%" 4'-2" 25'-9" 7.3

Downstream Endsection \* 8'-0" 2'-0" (Increase Headwall Height,

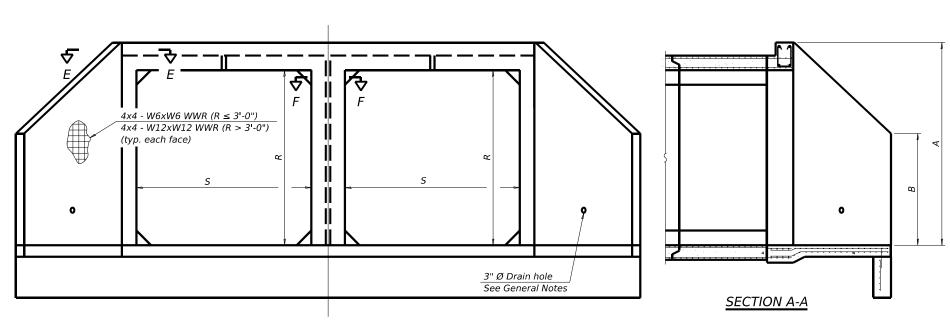
NOIS	PRECAST C
ICDODTATION	APRON END SEC

SCALE:

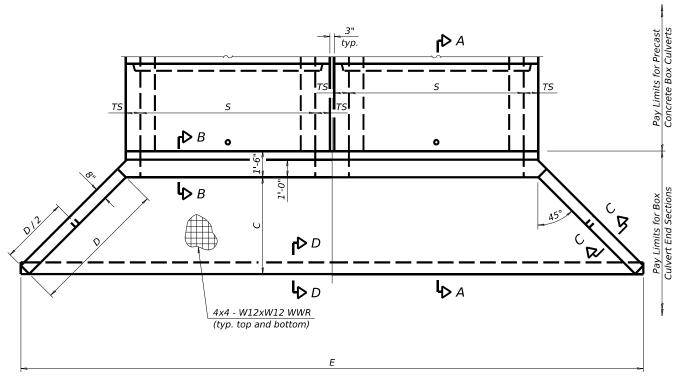
CONCRETE BOX CULVERT CTION DETAILS SN 033-7020 SHEET SHEETS STA.

	(Sheet 1 of 2										
Ρ.	SECTION		COUNTY	TOTAL SHEETS	SHEET NO.						
	109CR-1;102CR-1		**	20	16						
		CONTRACT	NO. 789	999							
	ILLINOIS	FED. A	ID PROJECT								

\*328 & 776 \*\* WHITE & HAMILTON



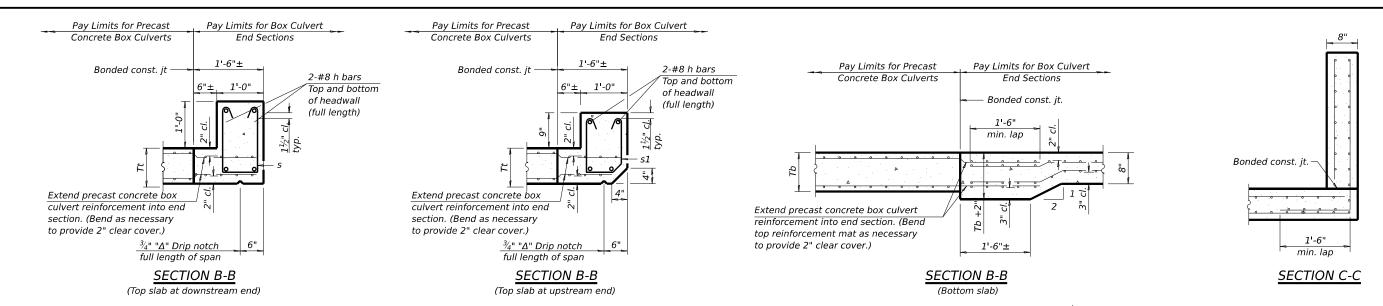
## **END VIEW**

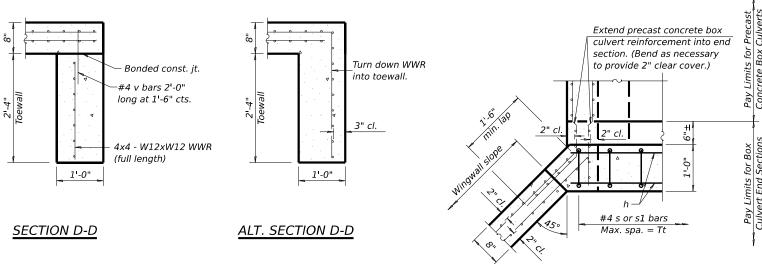


<u>PLAN</u>

SER NAME = derek.snider DESIGNED REVISED DRAWN REVISED PLOT SCALE = 0.16666633 ' / in. CHECKED REVISED PLOT DATE = 1/31/2024 REVISED DATE

STATE OF ILLIN **DEPARTMENT OF TRANSPORTATION** 





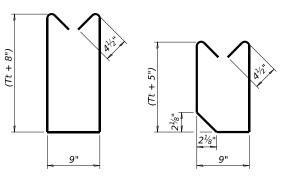
#### TOEWALL CONSTRUCTION SEQUENCE

- 1. Perform excavation and construct toewall. 2. Backfill accordingly and prepare bedding for box culvert end sections.
- 3. Construct remainder of box culvert end section.

#### Note:

If soil conditions permit, the toewall may be poured monolithically with the bottom slab of the end section using Alt. Section D-D subject to approval from the Engineer.

## SECTION E-E



<u>BAR s</u>

BAR s1

\_ **©** 3" norminal space filled with Class SI Concrete per Article 540.06 of the Standard Specifications Ts Ts

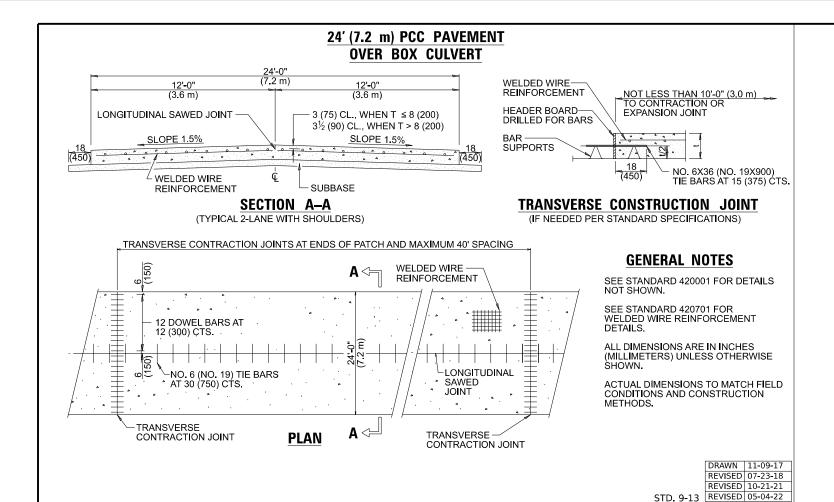
– Bonded const. jt. Extend precast concrete box Pay Limits for Box Culvert End Sections culvert reinforcement into end typ. section. (Bend as necessary to provide 2" clear cover.) Bent 4x4 - W12xW12 WWR Extend to outside mat of reinforcemnet in top and

bottom slab of box culvert.

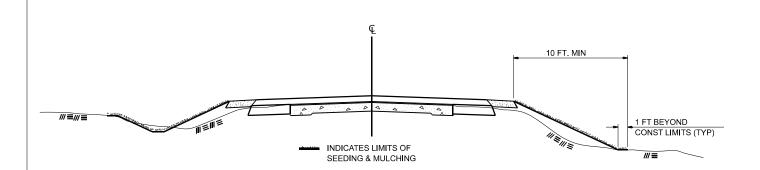
SECTION F-F

(Sheet 2 of 2)

												(,	SHEEL Z OF Z	۷)
USER NAME = derek.snider	DESIGNED -	REVISED -			DD EC/	ST CON	ICDETE	BOX CI	II VEDT	F.A.P. RTE	SECTION	COUNTY	TOTAL SHI	EET
	DRAWN -	REVISED -	STATE OF ILLINOIS	PRECAST CONCRETE BOX CULVERT APRON END SECTION DETAILS SN 033-7020					*	109CR-1;102CR-1	**	20	17	
PLOT SCALE = 0.16666633 / in.	CHECKED -	REVISED -	DEPARTMENT OF TRANSPORTATION						1 033-7020			CONTRAC	T NO. 78999	,—
PLOT DATE = 1/31/2024	DATE -	REVISED -		SCALE:	SHEET	OF	SHEETS	STA.	TO STA.		ILLINOIS	FED. AID PROJECT		



## **SEEDING & MULCHING**



#### **GENERAL NOTES**

SHEET

IN GENERAL, ALL EARTH SURFACES DISTURBED DURING CONSTRUCTION OPERATIONS SHALL BE SEEDED AND MULCHED UPON COMPLETION OF ALL GRADING OPERATIONS.

ON DETOUR ROADS, SLOPES SHALL BE SEEDED IMMEDIATELY UPON COMPLETION OF ANY GIVEN STAGE GRADING. TEMPORARY SEEDING SHALL BE CLASS 7.

FERTILIZER NUTRIENTS SHALL BE APPLIED TO ALL SEEDED AREAS. LIMESTONE SHALL BE APPLIED TO ALL AREAS OF FINAL SEEDING.

THE RATES OF APPLICATION OF FERTILIZER, MULCH AND LIMESTONE SHALL BE AS SPECIFIED IN THE SPECIAL PROVISIONS FOR ROAD AND BRIDGE CONSTRUCTION.

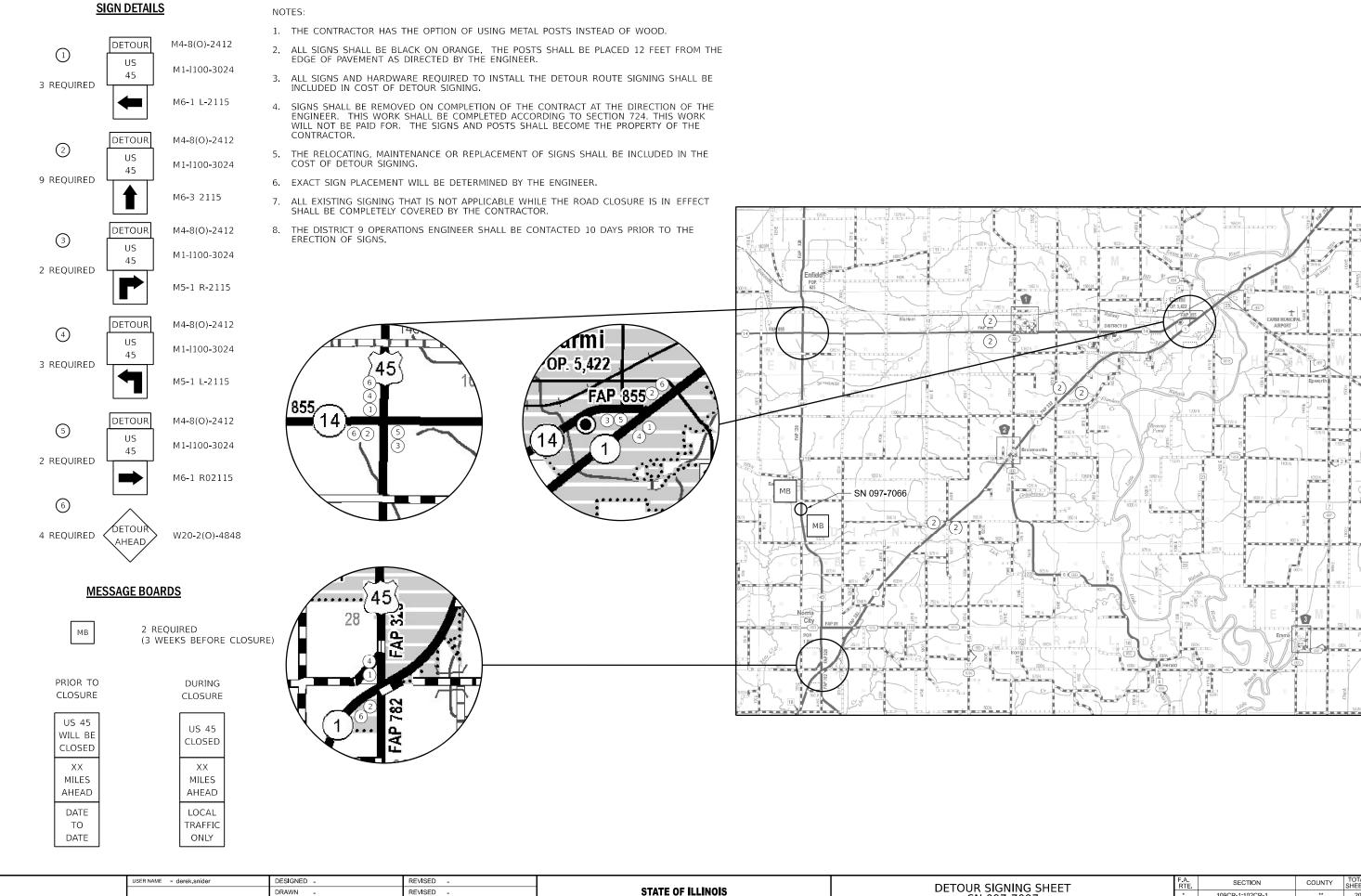
SECTIONS 250 AND 251 SHALL GOVERN THIS WORK EXCEPT AS SPECIFIED HEREIN OR AS NOTED IN THE SPECIAL PROVISIONS.

DRAWN 02-15-89
REVISED 03-27-08
REVISED 10-21-21
STD. 9-19
REVISED 05-27-22

USER NAME = derek,snider	DESIGNED -	REVISED -
	DRAWN -	REVISED -
PLOT SCALE = 0.16666633 / in.	CHECKED -	REVISED -
PLOT DATE = 1/31/2024	DATE -	REVISED -

STATE OF ILLINOIS	
<b>DEPARTMENT OF TRANSPORT</b>	ATION

								ID. 5	19	_   00 _	
				F.A.P. RTE	SECT	ION		COUNTY	TOTAL SHEETS	SHEET NO.	
DISTRICT STANDARDS		*	109CR-1;10	2CR-1		**	20	18			
									CONTRACT	NO. 78	999
	OF	SHEETS	STA.	TO STA.			HUMOIS	EED All	DROIECT		



DEPARTMENT OF TRANSPORTATION

SHEET

CHECKED

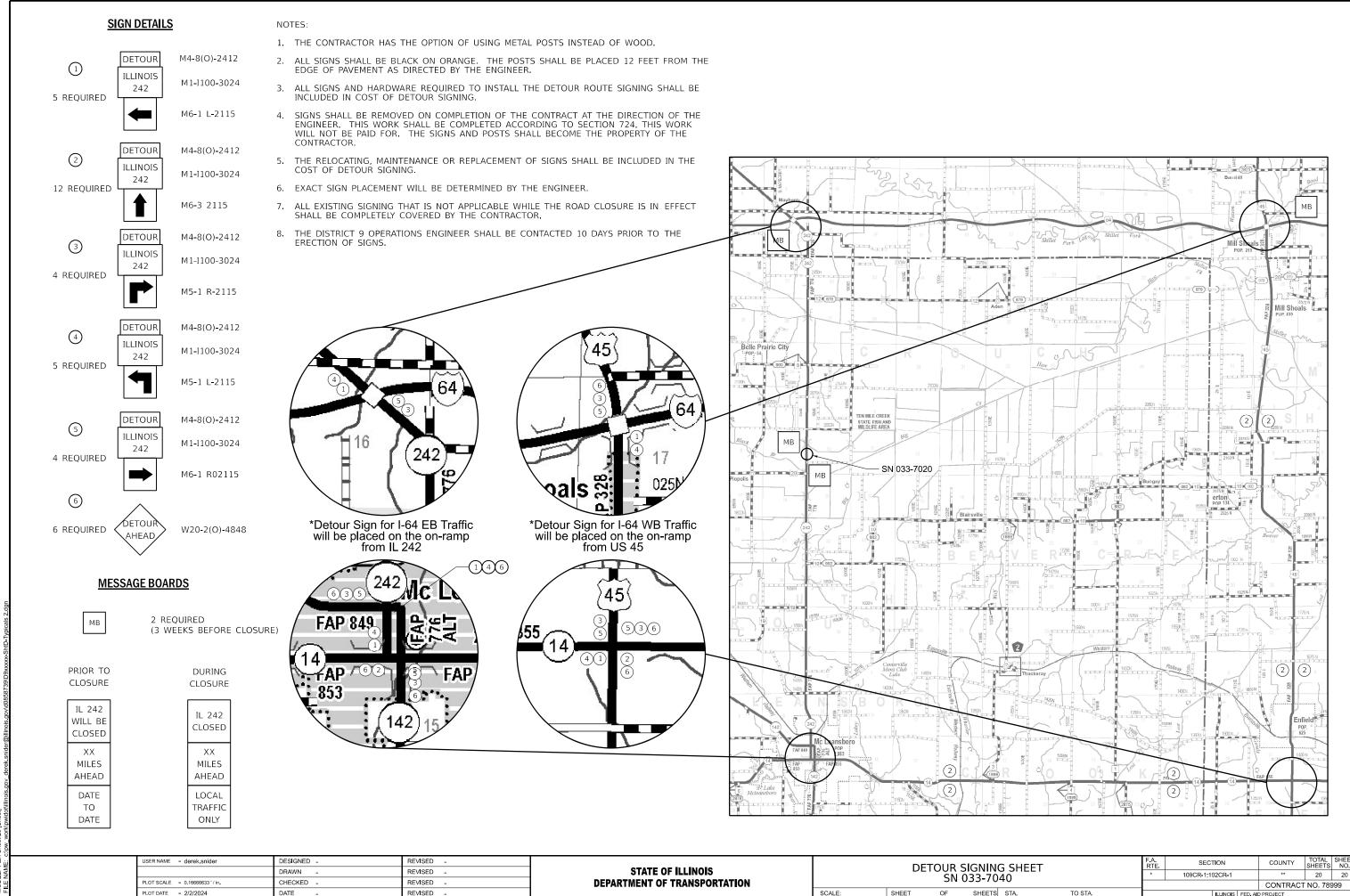
DATE

PLOT DATE = 2/21/2024

REVISED

REVISED

\*328 & 776 \*\* WHITE & HAMILTON



MODEl : Plan Sheet 20 [Sheet]

\*328 & 776 \*\* WHITE & HAMILTON