#### 09-19-2025 LETTING ITEM 085

### **STATE OF ILLINOIS**

## ILLINOIS CONTRACT NO. 99745

#### **INDEX OF SHEETS**

	<u> </u>
HEET NO.	DESCRIPTION
1	COVER SHEET
2	GENERAL NOTES
3–4	SUMMARY OF QUANTITIES
5	SCHEDULE OF QUANTITIES
6	TYPICAL SECTIONS
7	PLAN & PROFILE
8–10	PROPOSED CULVERT PLANS
11	DETOUR PLAN
12	CROSS SECTIONS

# **DEPARTMENT OF TRANSPORTATION**

# PLANS FOR PROPOSED

SURFACE TRANSPORTATION PROGRAM OFF SYSTEM BRIDGE

PROJECT V2QJ(332)

**FAS 962 (COUNTRY CLUB ROAD) SECTION 23-00110-00-DR MASSAC COUNTY** C-99-059-24

#### **HIGHWAY STANDARDS**

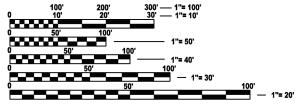
STD SYMBOLS, ABBREVIATIONS, & PATTERNS TEMPORARY EROSION CONTROL SYSTEMS 280001-07 420001-10 **PAVEMENT JOINTS** 24' JOINTED PCC PAVEMENT 420101-07 420701-03 PAVEMENT WELDED WIRE REINFORCEMENT

515001-04 NAME PLATES FOR BRIDGES 701901-10 TRAFFIC CONTROL DEVICES

TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES BLR 21-9 FOR CONSTRUCTION ON RURAL LOCAL HIGHWAYS TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES FOR CONSTRUCTION ON RURAL LOCAL HIGHWAYS (2L2W — ROAD CLOSED TO THRU TRAFFIC BLR 22-7

**UTILITIES** 

FRONTIER COMMUNICATIONS **CLEARWAVE COMMUNICATIONS** LIBERTY UTILITIES FORT MASSAC WATER DISTRICT AMEREN ILLINOIS CITY OF METROPOLIS XFINITY CABLE



**FULL SIZE PLANS HAVE BEEN PREPARED USING STANDARD ENGINEERING SCALES. REDUCED SIZED PLANS WILL NOT CONFORM TO STANDARD SCALES. IN MAKING MEASUREMENTS** ON REDUCED PLANS, THE ABOVE SCALES MAY BE USED.

J.U.L.I.E. **JOINT UTILITY LOCATION INFORMATION FOR EXCAVATION** 1-800-892-0123

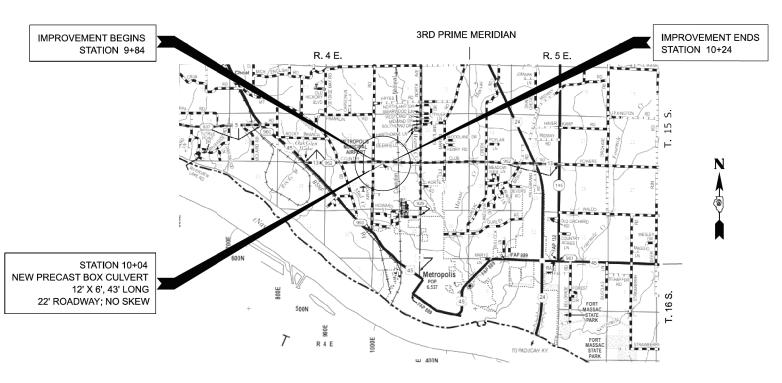
 $\circ$ 

 $\circ$ 

**COUNTY ENGINEER: BRAD WATSON** 

2736 NORTH AVENUE METROPOLIS, IL 62960 618-524-5227

**CONTRACT NO.: 99745** 



### **LOCATION MAP**



GROSS LENGTH = 40 FT. = 0.0076 MILE NET LENGTH = 40 FT. = 0.0076 MILE



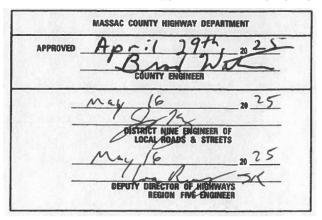
**LOCATION OF SECTION INDICATED THUS: -**

FUNCTIONAL CLASSIFICATION: MAJOR COLLECTOR DESIGN TRAFFIC:

DESIGN SPEED: 40 MPH



403 North Court Street, Marion, IL 62959 618-997-9190 / BFWengineers.com



PRINTED BY THE AUTHORITY OF THE STATE OF ILLINOIS

- 1. ALL CONSTRUCTION SHALL BE DONE IN ACCORDANCE WITH THE STATE OF ILLINOIS "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION", ADOPTED JANUARY 1, 2022, (HERE IN AFTER REFERRED TO AS THEE STANDARD SPECIFICATIONS), THE "SUPPLEMENTAL SPECIFICATIONS AND RECURRING SPECIAL PROVISIONS", ADOPTED JANUARY 1, 2025, THE LATEST EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS", THE "ILLINOIS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS", THE DETAILS IN THE PLANS AND THE "SPECIAL PROVIONS" INCLUDED IN THE DOCUMENTS.
- 2. ANY REFERENCE TO A HIGHWAY STANDARD THROUGHOUT THE PLANS OR SPECIAL PROVISIONS SHALL BE INTERPRETED TO BE THE LATEST STANDARD VERSION ISSUED BY THE DEPARTMENT.
- 3. FACTORS USED FOR ESTIMATING PLAN QUANTITIES ARE AS FOLLOWS AND SHALL NOT BE USED FOR THE BASIS OF FINAL QUANTITIES:

GRANULAR MATERIALS 2.05 TONS/CU. YD.

RIP RAP 1.50 TONS/CU. YD.

- 4. ANY SURPLUS EXCAVATION SHALL BE DISPOSED OF BY THE CONTRACTOR AS PER ARTICLE 202.03 AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.
- 5. THE AREAS TO BE SEEDED SHALL CONSIST OF ALL DISTURBED EARTH SURFACES WITHIN THE EXISTING AND PROPOSED RIGHT OF WAY OR AS DIRECTED BY THE ENGINEER. SEEDING SHALL NOT BE PERMITTED AT ANY TIME WHEN THE GROUND IS FROZEN, WET, OR IN AN UNTILLABLE CONDITION.
- 6. THE REMOVAL AND DISPOSAL OF ALL FENCING, DELINEATORS, SIGNS, DEBRIS, BRUSH, RIPRAP, STONE, CONCRETE SLABS, TILE, ETC. NOT PAID SPECIFICALLY IN THE PLANS SHALL BE INCLUDED IN THE COST OF EARTH EXCAVATION AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.
- 7. THE CONTRACTOR SHALL CONTACT JULIE AT LEAST 48 HOURS PRIOR TO EXCAVATION TO DETERMINE WHICH UTILITIES ARE IN THE AREA.
- 8. MEMBERS OF JULIE KNOWN TO BE NEAR THE LIMITS OF THE IMPROVEMENT ARE:

SOUTHERN ILLINOIS ELECTRIC COOP	FORT MASSAC WATER DISTRICT
FRONTIER	CLEARWAVE COMMUNICATIONS
CITY OF METROPOLIS	XFINITY CABLE
LIBERTY UTILITIES	

 USER NAME
 = gsmothers
 DESIGNED REVISED 

 DRAWN REVISED 

 PLOT SCALE = 100,000 '/ in.
 CHECKED REVISED 

 PLOT DATE = 2/11/2025
 DATE REVISED

STATE OF ILLINOIS
MASSAC COUNTY HIGHWAY DEPARTMENT

SHEET

 COUNTRY CLUB ROAD
 FA.S RTE.
 SECTION
 COUNTY
 TOTAL SHEETS NO

 GENERAL NOTES
 962
 23-00110-00-DR
 MASSAC
 12
 2

 OF
 SHEETS
 STA.
 TO STA.
 ILLINOIS FED. AID PROJECT

CONSTR. CODE
--------------

CODE			TOTAL	NONE 0004
NO.	ITEM	UNIT	QUANTITY	S.N.
,				
20700110	POROUS GRANULAR EMBANKMENT	TON	250	250
25000210	SEEDING, CLASS 2A	ACRE	0.1	0.1
		1101	0.1	0.1
25100630	EROSION CONTROL BLANKET	SQ YD	136	136
28000400	PERIMETER EROSION BARRIER	FOOT	150	150
28100107	STONE RIPRAP, CLASS A4	SQ YD	200	200
			1 1	
35100100	AGGREGATE BASE COURSE, TYPE A	TON	35	35
42000501	PORTLAND CEMENT CONCRETE PAVEMENT 10" (JOINTED)	SQ YD	123	123
44000100	PAVEMENT REMOVAL	SQ YD	123	123
44200050	WELDED WIRE REINFORCEMENT	SQ YD	123	123
44213200	SAW CUTS	FOOT	44	44
48100500	AGGREGATE SHOULDERS, TYPE A 6"	SQ YD	45	45
48301000	PROTECTIVE COAT	SQ YD	123	123
50105220	PIPE CULVERT REMOVAL	FOOT	88	88
50200100	STRUCTURE EXCAVATION	CU YD	380	380

\* SPECIALTY ITEM

USER NAME = gsmothers	DESIGNED -	REVISED -
	DRAWN -	REVISED -
PLOT SCALE = 100.000 ' / In.	CHECKED -	REVISED -
PLOT DATE = 10/15/2024	DATE -	REVISED -

STATE OF ILLINOIS
MASSAC COUNTY HIGHWAY DEPARTMENT

SCALE:

	COUNT	RY CLUB	ROAD		F.A.S RTE	SEC <sup>-</sup>	ΓΙΟΝ		COUNTY	TOTAL SHEETS	SHEET NO.
	SUMMARY	V OF OUR	NTITIE	9	929	23-00110-00	-DR		MASSAC	12	3
	OUMINAN	1 01 407	//////////////////////////////////////	9					CONTRACT	NO. 99	745
SHEET	OF	SHEETS	STA.	TO STA.			ILLINOIS	FED. All	D PROJECT		

CONSTR. COD	E
-------------	---

CODE			TOTAL	NONE 0004
NO.	ITEM	UNIT	QUANTITY	S.N.
51500100	NAME PLATES	EACH	1	1
54001001	BOX CULVERT END SECTIONS, CULVERT NO. 1	EACH	2	2
54011206	PRECAST CONCRETE BOX CULVERTS 12' X 6'	FOOT	36	36
63000001	STEEL PLATE BEAM GUARDRAIL, TYPE A, 6 FOOT POSTS	FOOT	438	438
63100167	TRAFFIC BARRIER TERMINAL, TYPE 1 (SPECIAL) TANGENT	EACH	2	2
67100100	MOBILIZATION	L SUM	1	1
72501000	TERMINAL MARKER - DIRECT APPLIED	EACH	2	2
78001110	PAINT PAVEMENT MARKING - LINE 4"	FOOT	150	150
78100100	RAISED REFLECTIVE PAVEMENT MARKER	EACH	2	2
78200006	GUARDRAIL REFLECTORS, TYPE B	EACH	10	10
X5810103	MEMBRANE WATERPROOFING SYSTEM FOR BURIED STRUCTURES	SQ YD	118	118
X6300155	STEEL PLATE BEAM GUARDRAIL, ATTACHED TO STRUCTURES (SPECIAL)	FOOT	48	48
X6330725	STEEL PLATE BEAM GUARDRAIL (SHORT RADIUS)	FOOT	35	35
X7010216	TRAFFIC CONTROL AND PROTECTION, (SPECIAL)	L SUM	1	1

\* SPECIALTY ITEM

USER NAME = gsmothers	DESIGNED -	REVISED -
	DRAWN -	REVISED -
PLOT SCALE = 100.000 ' / In.	CHECKED -	REVISED -
PLOT DATE = 10/15/2024	DATE -	REVISED -

STATE OF ILLINOIS
MASSAC COUNTY HIGHWAY DEPARTMENT

SCALE:

	COUNT	RY CLUB	ROAD		F.A.S RTE	SEC.	TION		COUNTY	TOTAL SHEETS	SHE
	SUMMARY	V OF OUR	NTITIE	<b>e</b> [	962	23-0011	0-00-DR		MASSAC	12	4
	OUMINAI	1 01 407	(IVIIII)						CONTRACT	NO. 99	745
SHEET	OF	SHEETS	STA.	TO STA.			ILLINOIS	FED. AII	D PROJECT		

### **PAVEMENT**

LOCATION STATION TO STATION	DESC.	AGGREGATE BASE COURSE, TYPE A 35100100 TON	PORTLAND CEMENT CONCRETE PAVEMENT 10" (JOINTED) 42000501 SQ YD	WELDED WIRE REINFORCEMENT 42000050 SQ YD	PAVEMENT REMOVAL 44000100 SQ YD	SAW CUTS 44213200 FOOT	AGGREGATE SHOULDERS, TYPE A, 6" 48100500 SQ YD	PROTECTIVE COAT 48301000 SQ YD
9+84.00 TO 10+24.00		35	123	123	123	44	45	123
	TOTAL	35	123	123	123	44	45	123

### **GUARDRAIL**

LOCATION STATION TO STATION		SIDE	STEEL PLATE BEAM GUARDRAIL, TYPE A, 6 FOOT POSTS 63000001 FOOT	_	GUARDRAIL REFLECTORS, TYPE B 78200006 EACH	TERMINAL MARKER - DIRECT APPLIED 72501000 EACH	STEEL PLATE BEAM GUARDRAIL ATTACHED TO STRUCTURES X6300155 FOOT	STEEL PLATE BEAM GUARDRAIL (SHORT RADIUS) X6330725 EACH	
MASSAC COUNTY									
C.H. 13	3								
8+53	TO	12+17	LT	263.0	2	6	2	24	
8+89	TO	10+90	RT	175.0		4		24	35
	,		TOTAL	438.0	2.0	10.0	2.0	48.0	35.0

### **EROSION CONTROL**

LOCATION/ STATION			RT/LT	SEEDING, CLASS 2	EROSION CONTROL BLANKET	PERMIMETER EROSION CONTROL BARRIER	STONE DUMPED RIP RAP CL A4
				25000210	25100630	28000400	28100107
				ACRE	SQ YD	FOOT	TON
MASSAC COUNTY							
C.H. 8							
9+75	TO	10+04	LT	0.025	34.00	35	
9+75	TO	10+04	RT	0.025	34.00	35	
9+95	TO	10+15	LT & RT				200
10+00	TO	10+35	LT	0.025	34.00	40	
10+00	TO	10+35	RT	0.025	34.00	40	
<u> </u>		TOTALS		0.10	136	150	200

### **PAVEMENT MARKINGS**

LOCATION STATION TO STATION		DESCRIPTION	PAINT PAVEMENT MARKING - LINE 4 WHITE 78001110 FOOT	PAINT PAVEMENT MARKING - LINE 4 YELLOW 78001110 FOOT	RAISED REFLECTIVE PAVEMENT MARKERS 78100100 EACH	
MAS	MASSAC COUNTY					
C.H. 13						
9+80	TO	10+30		100	50	2
			TOTAL	100	50	2

 USER NAME
 = gsmothers
 DESIGNED
 REVISED

 DRAWN
 REVISED

 PLOT SCALE
 = 100,000 °/ In.
 CHECKED
 REVISED

 PLOT DATE
 = 2/11/2025
 DATE
 REVISED

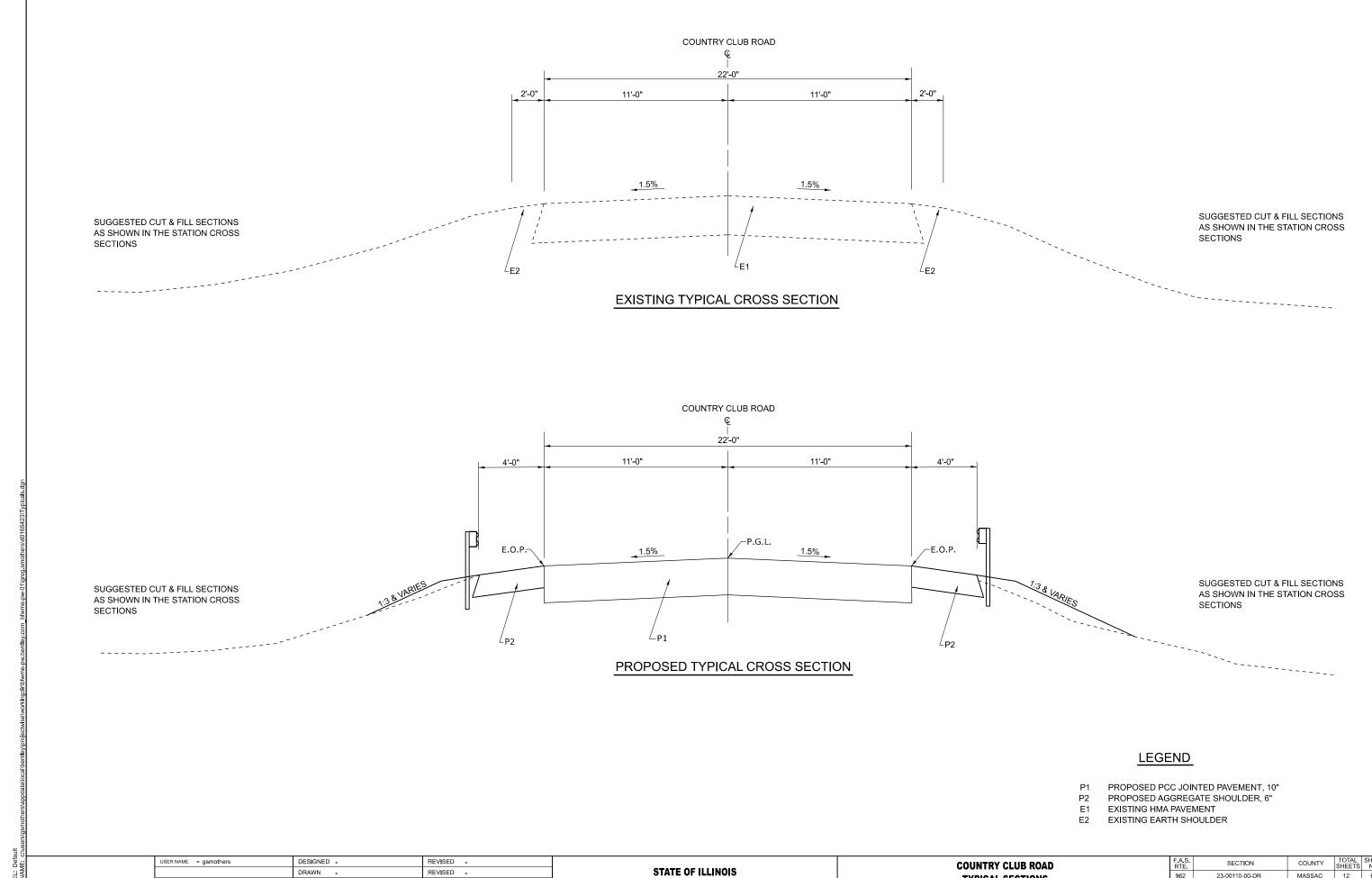
STATE OF ILLINOIS
MASSAC COUNTY HIGHWAY DEPARTMENT

 COUNTRY CLUB ROAD
 FAS RTE.
 SECTION
 COUNTY
 TOTAL SHEETS NO.

 SCHEDULES OF QUANTITIES

 T
 OF
 SHEETS
 STA.
 TO STA.
 ILLINOIS FED. AID PROJECT
 CONTRACT NO. 99745

smotners/appoata/local/bentley/projectwise/workinggin/brwme-pw.bentley.com\_brwme-pw-u l/greg.smotn



REVISED -

REVISED -

CHECKED -

DATE

PLOT DATE = 2/11/2025

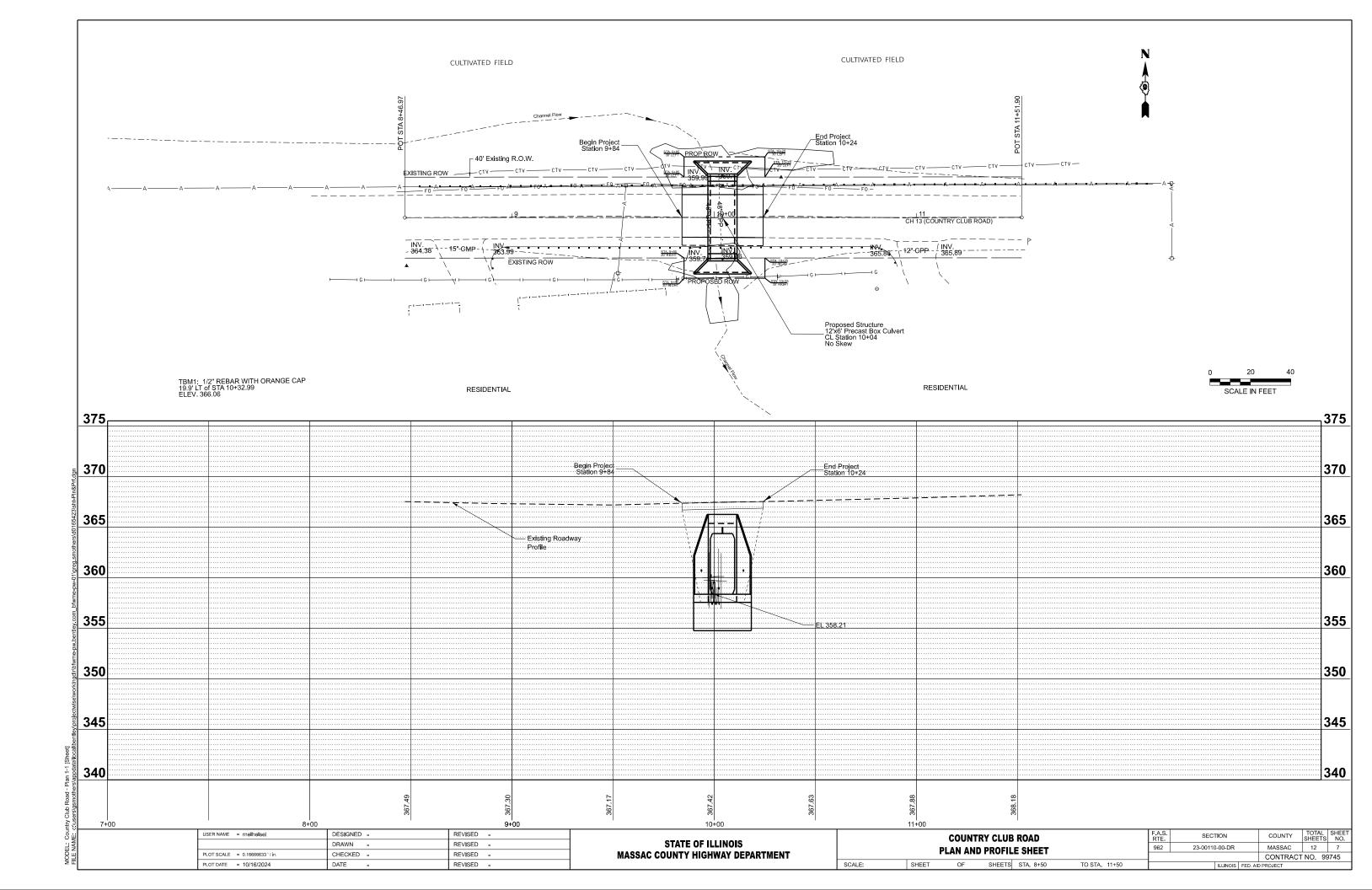
STATE OF ILLINOIS MASSAC COUNTY HIGHWAY DEPARTMENT

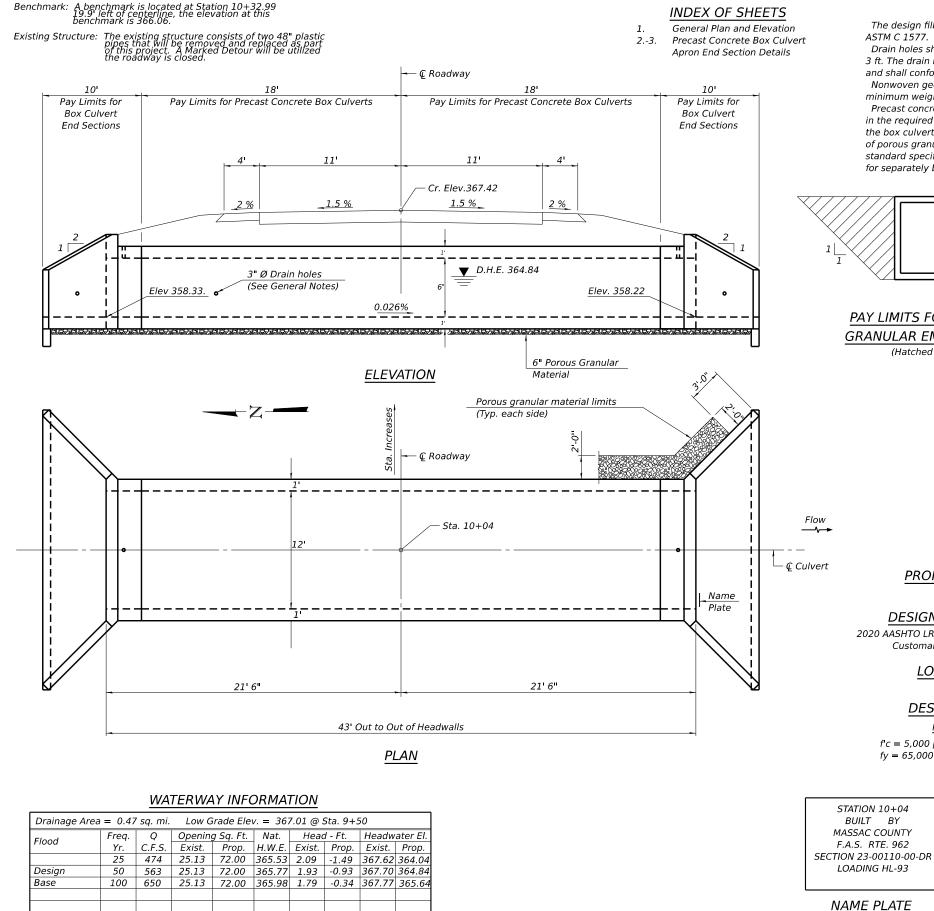
**COUNTRY CLUB ROAD** TYPICAL SECTIONS SHEET OF SHEETS STA.

TO STA.

COUNTY TOTAL SHEET NO.

MASSAC 12 6 SECTION 23-00110-00-DR CONTRACT NO. 99745





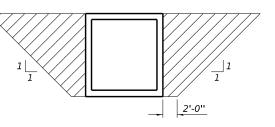
#### **GENERAL NOTES**

The design fill height for this box is 2.0 ft. The precast box culvert sections shall conform to the requirements of ASTM C 1577.

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 Specification.

Nonwoven geotextile fabric shall conform to the requirements of Art. 1080.01 of the Standard Specifications. The minimum weight of the fabric shall be 6 ounces per square yard.

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 top of the box culvert 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.



PAY LIMITS FOR POROUS GRANULAR EMBANKMENT

(Hatched area)

3'-0" ½" Square foam blockout around PVC drain (to be removed with formwork)

Pay Limits for Box

Culvert End Sections

Pay Limits for Precast Concrete Box Culverts 12" x12" x6" block of CA5, CA7, or CA11 coarse aggregate placed over drain opening. Block of aggregate shall be completely wrapped in nonwoven geotextile fabric. Provide a double layer of 12" x 12" nonwoven geotextile fabric centered over the drain hole. Perimeter of fabric shall be sealed to the concrete with mastic. 3" Ø PVC drain cast with the concrete (Adjust location to clear reinforcement)

#### 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.)

### PROFILE GRADE

#### **DESIGN SPECIFICATIONS**

2020 AASHTO LRFD Bridge Design Specifications Customary U.S. Units, 9th Edition

LOADING HL-93

#### **DESIGN STRESSES**

PRECAST UNITS

f'c = 5,000 psify = 65,000 psi (Welded Wire Reinforcement)

LOCATION SKETCH

SHEET

#### TOTAL BILL OF MATERIAL

ITEM	UNIT	TOTAL
Pipe Culvert Removal	Each	88
Name Plates	Each	1
Box Culvert End Sections, Culvert No. 1	Each	2
Precast Concrete Box Culverts, 12'x6'	Foot	36
Porous Granular Embankment	Cu. Yd.	250
Structure Excavation	Cu. Yd.	380
Memb. Waterproofing Sys. for Buried Struct	Sq. Yd.	118

GENERAL PLAN AND ELEVATION F.A.S. 962 OVER UNNAMED STREAM SECTION 23-00110-00-DR MASSAC COUNTY STATION 10+04

USER NAME = gsmothers	DESIGNED -	REVISED -
	DRAWN -	REVISED -
PLOT SCALE = 2.000 '/In.	CHECKED -	REVISED -
PLOT DATE = 7/16/2025	DATE -	REVISED -

5-15-2023

SCB-GPE

STATE OF ILLINOIS **MASSAC COUNTY HIGHWAY DEPARTMENT** 

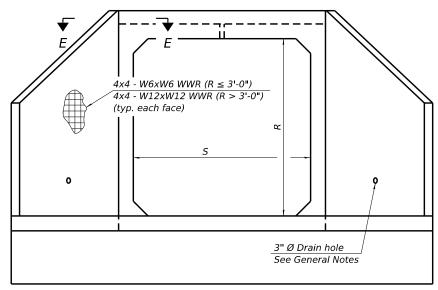
See Std. 515001

SCALE:

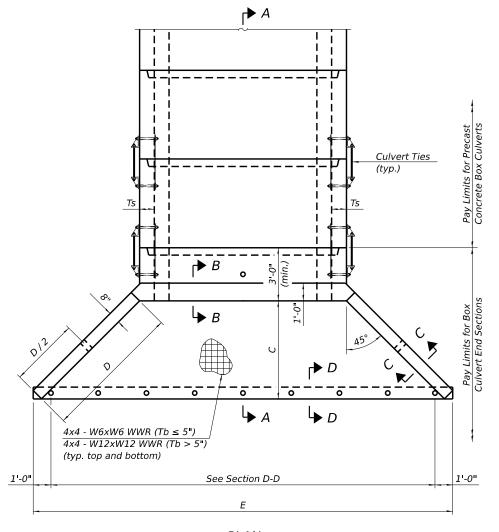
	TRY CLUB PLAN & EL		
OF	SHEETS	STA.	

TO STA.

A.S. RTE	SEC <sup>-</sup>	TION	COUNTY	TOTAL SHEETS	SHE	
962	23-00110-00-DR			MASSAC	12	8
			CONTRACT	NO. 997	745	
ILLINOIS FED AID DRO FOT						



#### **END VIEW**



#### PLAN

SCB-AES 5-15-2023

USER NAME = gsmothers	DESIGNED -	REVISED -
	DRAWN -	REVISED -
PLOT SCALE = 2.000 ' / In.	CHECKED -	REVISED -
PLOT DATE = 5/30/2024	DATE -	REVISED -

6'-0" min.  $(R \le 3'-0")$ See General Notes 10'-0" min. (R > 3'-0") regarding culvert ties. 0 4 SECTION A-A

#### **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

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

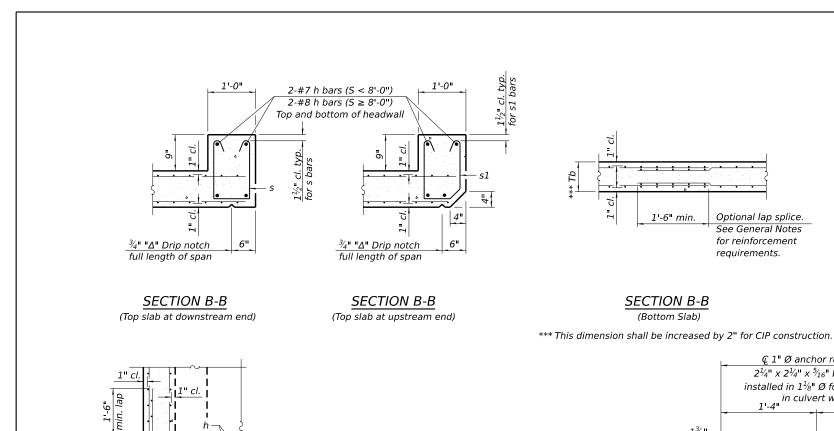
								LIVSION			
Span (S)	Rise (R)	Tt	Tb	Ts	Α	В	С	D	E	Concrete Cu. Yd.	Culvert Ties Required
3'-0"	2'-0"	7"	6"	4"	3'-4"	2'-2"	2'-105/8"	4'-1"	10'-45/8"	2.8	Yes
3'-0"	2'-0"	4"	4"	4"	3'-1"	2'-1"	2'-7%"	3'-9"	9'-11"	2.3	Yes
3'-0"	3'-0"	7"	6"	4"	4'-4"	2'-8"	3'-10 <sup>5</sup> / <sub>8</sub> "	5'-6"	12-45/8"	3.7	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'-21/2"	2'-113/8"	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'-113/8"	5'-7"	13'-81/8"	4.2	Yes
4'-0"	3'-0"	5"	5"	5"	4'-2"	2'-7"	3'-8½"	5'-3"	13'-23/8"	3.7	Yes
4'-0"	4'-0"	7.5"	6"	5"	5'-4 <sup>1</sup> / <sub>2</sub> "	3'-2½"	4'-113/8"	7'-0"	15'-81/8"	5.3	Yes
4'-0"	4'-0"	5"	5"	5"	5'-2"	3'-1"	4'-85/8"	6'-8"	15'-2½"	4.7	Yes
5'-0"	2'-0"	8"	7"	6"	3'-5"	2'-3"	2'-113/8"	4'-2"	12'-10"	3.9	Yes
5'-0"	2'-0"	6"	6"	6"	3'-3"	2'-2"	2'-10"	4'-0"	12'-71/4"	3.5	Yes
5'-0"	3'-0"	8"	7"	6"	4'-5"	2'-9"	3'-11 <sup>3</sup> / <sub>8</sub>	5'-7"	14'-101/8"	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'-101/8"	6.1	Yes
5'-0"	4'-0"	6"	6"	6"	5'-3"	3'-2"	4'-91/4"	6'-9"	16'-57/8"	5.5	Yes
5'-0"	5'-0"	8"	7"	6"	6'-5"	3'-9"	5'-11 <sup>3</sup> / <sub>8</sub> "	8'-5"	18'-101/8"	7.4	Yes
5'-0"	5'-0"	6"	6"	6"	6'-3"	3'-8"	_	8'-2"			Yes
			7"	7"			5'-9 <sup>1</sup> / <sub>4</sub> "	4'-2"	18'-57/8"	6.8	Yes
6'-0"	2'-0"	8"	7"		3'-5"	2'-3"	2'-113/8"		14'-0"	4.3	
6'-0"	2'-0"	7"		7"	3'-4"	2'-2"	2'-105/8"	4'-1"	13'-10%"	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"	7"	7"	7"	5'-4"	3'-2"	4'-10¾"	6'-11"	17'-10¾"	6.5	Yes
6'-0"	5'-0"	8"	7"	7"	6'-5"	3'-9"	5'-113/8"	8'-5"	20'-01/8"	8.0	Yes
6'-0"	5'-0"	7"	7"	7"	6'-4"	3'-8"	5'-10¾"	8'-4"	19'-10¾"	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'-10¾"	9'-9"	21'-10¾"	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'-2 <sup>1</sup> / <sub>8</sub> "	6.1	Yes
7'-0"	4'-0"	8"	8"	8"	5'-5"	3'-3"	4'-11 <sup>3</sup> / <sub>8</sub> "	7'-0"	19'-21/8"	7.4	Yes
7'-0"	5'-0"	8"	8"	8"	6'-5"	3'-9"	5'-11 <sup>3</sup> / <sub>8</sub> "	8'-5"	21'-21/8"	8.9	Yes
7'-0"	6'-0"	8"	8"	8"	7'-5"	4'-3"	6'-11 <sup>1</sup> / <sub>2</sub> "	9'-10"	23'-21/4"	10.6	Yes
8'-0"	2'-0"	8"	8"	8"	3'-5"	2'-3"	2'-11%"	4'-2"	16'-2"	5.3	Yes
8'-0"	3'-0"	8"	8"	8"	4'-5"	2'-9"	3'-11 <sup>3</sup> / <sub>8</sub> "	5'-7"	18'-2 <sup>1</sup> / <sub>8</sub> "	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'-2 <sup>1</sup> / <sub>8</sub> "	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'-2 <sup>1</sup> / <sub>8</sub> "	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'-6 <sup>7</sup> / <sub>8</sub> "	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'-03/4"	7'-2"	21'-67/8"	9.0	Yes
9'-0"	5'-0"	9"	9"	9"	6'-6"	3'-9"	6'-07/8"	8'-7"	23'-7"	10.6	Yes
9'-0"	6'-0"	9"	9"	9"	7'-6"	4'-3"	7'-0 <sup>1</sup> / <sub>8</sub> ''	9'-11"	25'-55%"	12.4	Yes
10'-0"	2'-0"	10"	10"	10"	3'-7"	2'-4"	3'-1½"	4'-5"	18'-101/4"	7.1	No
10'-0"	3'-0"	10"	10"	10"	4'-7"	2'-10"	4'-1½"	5'-10"	20'-101/4"	8.6	No
10'-0"	4'-0"	10"	10"	10"	5'-7"	3'-4"	5'-1½"	7'-3"	22'-103/8"	10.2	Yes
10'-0"	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'-10%"	13.9	Yes
11'-0"	2'-0"	11"	11"	11"	3'-8"	2'-4"	3'-27/8"	4'-7"	20'-31/8"	8.2	No
11'-0"	3'-0"	11"	11"	11"	4'-8"	2'-10"	4'-2 <sup>7</sup> / <sub>8</sub> "	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'-13/4"	11.5	Yes
11'-0"	5'-0"	11"	11"	11"	6'-8"	3'-10"	6'-21/4"	8'-9"	26'-13/4"	13.3	Yes
11'-0"	6'-0"	11"	11"	11"	7'-8"	4'-4"	7'-2 <sup>1</sup> / <sub>4</sub> "	10'-2"	28'-17/8"	15.5	Yes
12'-0"	2'-0"	12"	12"	12"	3'-9"	2'-5"	7 -274 3'-3 <sup>5</sup> / <sub>8</sub> "	4'-8"	28 -178	9.3	No
12'-0"	3'-0"	12"	12"	12"	3 -9 4'-9"	2'-11"	3'-3%" 4'-35%"	6'-1"	23'-6½"	9.5	No
12'-0"	4'-0"	12"	12"	12"	5'-9"			7'-6"			Yes
		12"				3'-5"	5'-35/8"		25'-65/11	13.0	
12'-0"	5'-0"		12"	12"	6'-9"	3'-11"	6'-3 <sup>5</sup> / <sub>8</sub> "	8'-11"	27'-65/8"	14.1	Yes
12'-0"	6'-0"	12"	12"	12"	7'-9"	4'-5"	7'-3%"	10'-4"	29'-65/8"	17.4	Yes
Note:	:										

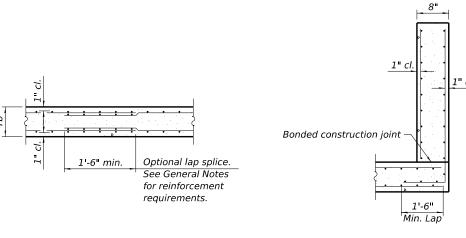
Two sets of apron end section dimensions are shown above for some box culvert sizes due to the top and bottom slabs having different thicknesses per ASTM C 1577 for design fill heights less than 2 ft. (Sheet 1 of 2)

PRECAST CONCRETE BOX CULVERT **APRON END SECTION DETAILS** SCALE: OF SHEETS STA. TO STA.

F.A.S. RTE	SECTION			COUNTY	TOTAL SHEETS	SHEET NO.
962	23-00110-00-DR			MASSAC	12	9
				CONTRACT	NO. 99	745
		ILLINOIS	FED AID	PROJECT		

#### STATE OF ILLINOIS **MASSAC COUNTY HIGHWAY DEPARTMENT**





SECTION C-C SECTION D-D

3" Ø corrugated PE pipe per Article 1040.04 of the Standard Specifications.

Fill with non-shrink grout

#4 v1 bars drilled and epoxy

grouted into toewall in 9" min. deep holes at 1'-6" cts., max.

6-#5 h1 bars placed as shown

#4 s2 bars at

1'-0" cts., max.

#### TOEWALL CONSTRUCTION SEQUENCE

1'-0"

- 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.

\*\* 1½" cl.

- 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.

### ℚ 1" Ø anchor rods with $2\frac{1}{4}$ " x $2\frac{1}{4}$ " x $\frac{5}{16}$ " R washers installed in $1\frac{1}{8}$ " Ø formed holes in culvert walls 1'-4" 1'-4" 13/4 Restraint angle #4 s3 bar (typ. for R > 3'-0")<del>-</del> — € Joint

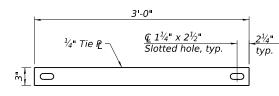
SECTION B-B

(Bottom Slab)

SECTION F-F (Showing culvert tie details)

### ∠ 6" x 4" x ½" anchor rod with $\mathcal{L}$ 1 $^{1}\!\!/_{4}$ " Ø hole in $2\frac{1}{4}$ " $\times 2\frac{1}{4}$ " $\times \frac{5}{16}$ " bottom leg of angle

### RESTRAINT ANGLE DETAIL



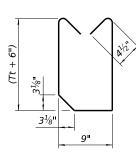
TIE PLATE DETAIL

SCALE:

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.  $2\frac{1}{4}$ "x $2\frac{1}{4}$ "x $2\frac{5}{16}$ " 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 bits in lieu of using formed holes.

9"

BAR s



#4 s or s1 bars at spacing = Tt

SECTION E-E

(Spacing need not be less than 8")

BAR s1

5-15-2023 JSER NAME = gsmothers DESIGNED -REVISED -DRAWN -REVISED -CHECKED -REVISED -PLOT DATE = 5/30/2024 REVISED -DATE

9"

BAR s2

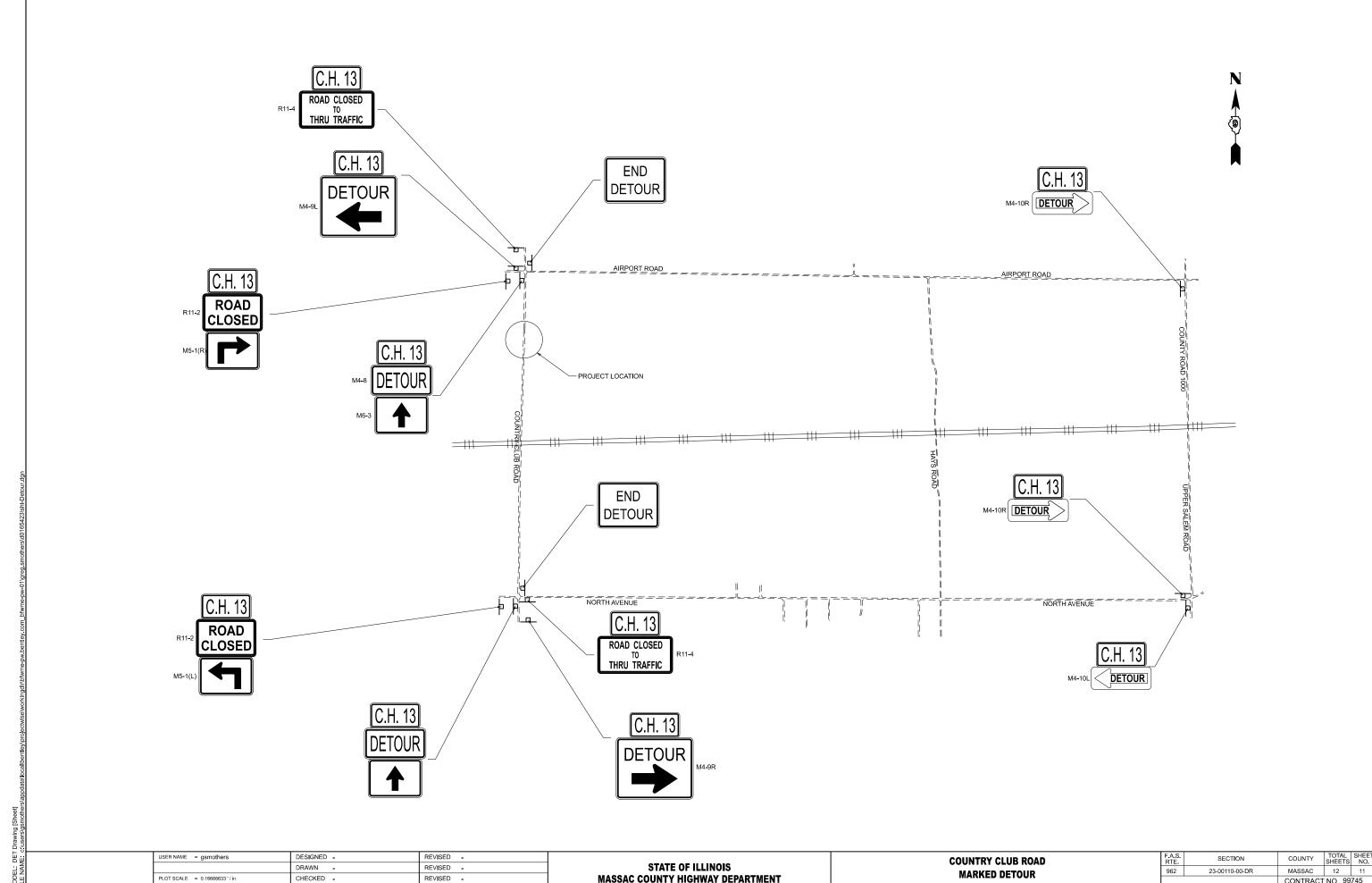
STATE OF ILLINOIS **MASSAC COUNTY HIGHWAY DEPARTMENT** 

	(Sheet 2 of 2)								
	PRECAST CONCRETE BOX CULVERT								
APRON END SECTION DETAILS									
	SHEET	OF	SHEETS	STA.	TO STA.				

SECTION COUNTY 962 23-00110-00-DR MASSAC 12 10 CONTRACT NO. 99745

SCB-AES

BAR s3



PLOT DATE = 5/30/2024

DATE

REVISED -

STATE OF ILLINOIS
MASSAC COUNTY HIGHWAY DEPARTMENT

SCALE:

SHEET

**MARKED DETOUR** SHEETS STA. TO STA. 
 COUNTY
 TOTAL SHEETS NO.

 MASSAC
 12
 11

 CONTRACT NO.
 99745

90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 -300 -290 -280 -270 -260 -250 -260 -250 -260 -250 -260 -250 -240 -230 -20 -210 -200 -190 -180 -170 -160 -150 -140 -130 -120 -110 -100 -90 -80 -70 -60 -50 -40 -30 -20 -10 0 380 375 370 365 360 355 -300 -290 -280 -270 -260 -250 -240 -230 -270 -260 -250 -240 -230 -20 -210 -200 -190 -180 -170 -160 -150 -140 -130 -120 -130 -100 -90 -80 -70 -60 -50 -40 -30 -20 -10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300

STA 10+04.00

380

375 370

365

360 355

350

COUNTY TOTAL SHEETS NO.

MASSAC 12 12 USER NAME = gsmothers DESIGNED -REVISED -**COUNTRY CLUB ROAD** SECTION STATE OF ILLINOIS DRAWN -REVISED -23-00110-00-DR **CROSS SECTIONS** MASSAC COUNTY HIGHWAY DEPARTMENT CHECKED -REVISED -CONTRACT NO. 99745 PLOT DATE = 6/18/2024 DATE REVISED -SCALE: 1"=20' SHEET OF SHEETS STA. 9+50.00 TO STA. 10+00.00