

### APRON AND HEADWALL BAR LIST

MARK	SIZE	FORM	10' SPAN			11' SPAN			12' SPAN		
			NO.	LENGTH	LENGTH VARIATION	NO.	LENGTH	LENGTH VARIATION	NO.	LENGTH	LENGTH VARIATION
ABD1	#4	STR.	24	4'-3"		26	4'-3"		28	4'-3"	
ABD2	#4	BNT.	4	5'-0"		4	5'-0"		4	5'-0"	
AD	#4	STR.	4	37'-6"		4	37'-6"		4	37'-6"	
AL1	#4	STR.	24	33'-7"		26	33'-7"		28	33'-7"	
AL2	#4	STR.	72	16'-11" AVG.	2'-3" TO 31'-7"	72	16'-11" AVG.	2'-3" TO 31'-7"	72	16'-11" AVG.	2'-3" TO 31'-7"
AT1	#4	STR.	4	49'-2"		4	50'-4"		4	51'-4"	
AT2	#4	STR.	33	30'-0" AVG.	11'-6" TO 48'-6"	33	31'-2" AVG.	12'-8" TO 49'-8"	33	32'-2" AVG.	13'-8" TO 50'-8"
AT3	#5	STR.	33	30'-0" AVG.	11'-6" TO 48'-6"	33	31'-2" AVG.	12'-8" TO 49'-8"	33	32'-2" AVG.	13'-8" TO 50'-8"
CH	#4	STR.	4	11'-6"		4	12'-8"		4	13'-8"	
CL1	#4	BNT.	14	4'-4"		15	4'-4"		16	4'-4"	
CL2	#4	BNT.	14	4'-4"		15	4'-4"		16	4'-4"	

① 4 SETS OF 18 BARS

NOTE:  
 QUANTITIES ARE FOR ONE END SECTION WHICH INCLUDES ONE HEADWALL, ONE APRON AND TWO WINGWALLS. PIPE RAILING IS BASED ON PLAN DIMENSION AT CENTERLINE OF RAILING.

### QUANTITIES

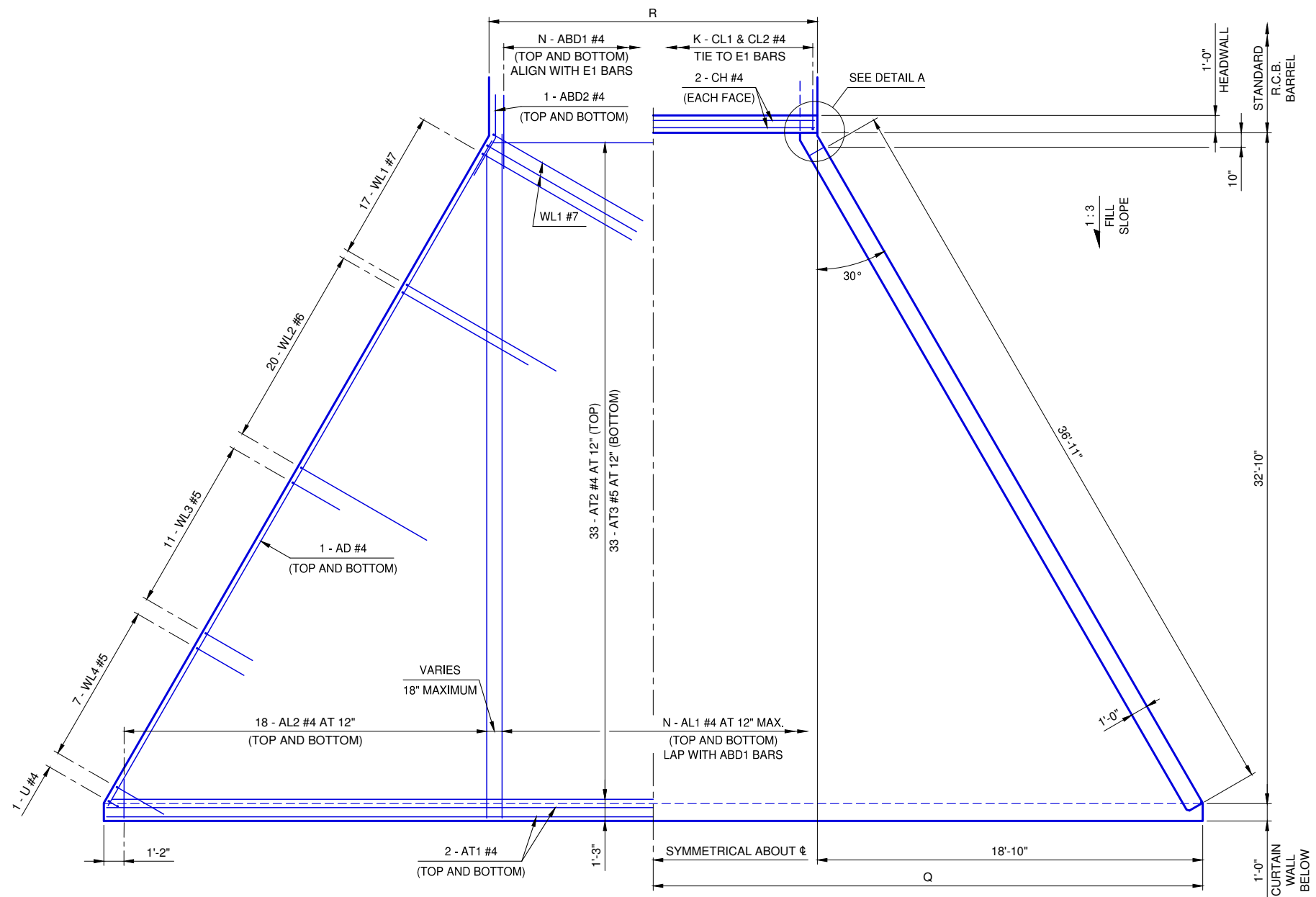
ITEM	UNIT	10' SPAN	11' SPAN	12' SPAN
CLASS AA CONCRETE	C.Y.	62.8	64.4	65.8
REINFORCING STEEL	LB.	8,370	8,500	8,620
PIPE RAILING	L.F.	87	88	89

### APRON VARIABLES

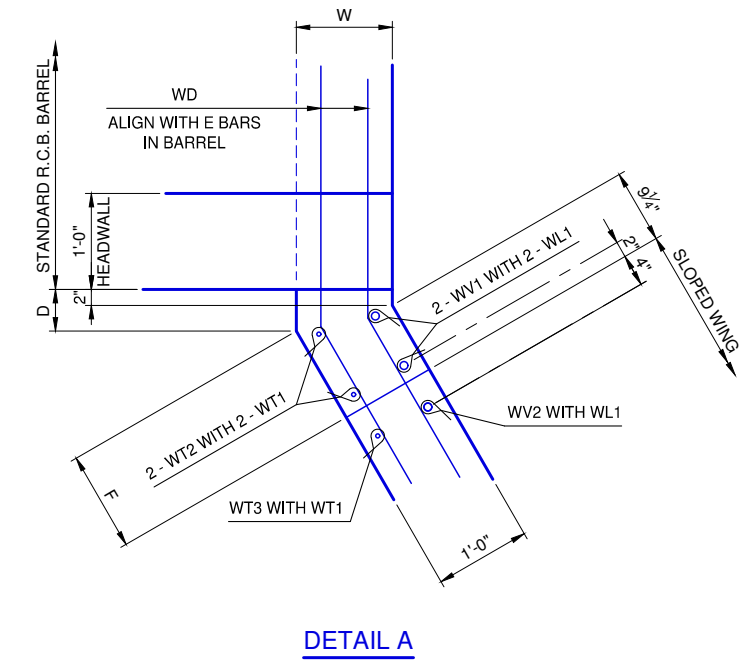
SPAN	DIMENSIONS		NO. OF BARS	
	R	Q	K	N
10'	11'-10"	24'-9"	14	12
11'	13'-0"	25'-4"	15	13
12'	14'-0"	25'-10"	16	14

### WINGWALL DIMENSIONS

SPAN	W	D	F
10'	11"	6 15/16"	10 7/16"
11'	12"	5 3/16"	1'-0 7/16"
12'	12"	5 3/16"	1'-0 7/16"



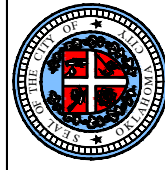
**APRON PLAN**




**DETAIL A**

REVISION NO.
DATE

The City of  
**Oklahoma City**  
 Public Works Department  
 Engineering Division



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APPROVED BY:   
 ERIC J. WENGER, P.E.  
 CITY ENGINEER

DATE: 6/22/2023

THESE STANDARD DRAWINGS AND ASSOCIATED CALCULATIONS HAVE BEEN PREPARED BY CEC CORPORATION UNDER CONTRACT WITH THE CITY OF OKLAHOMA CITY.

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**R.C.B. CULVERTS - END SECTION DETAILS**  
 SINGLE CELL - 10' HEIGHT - 0° SKEW

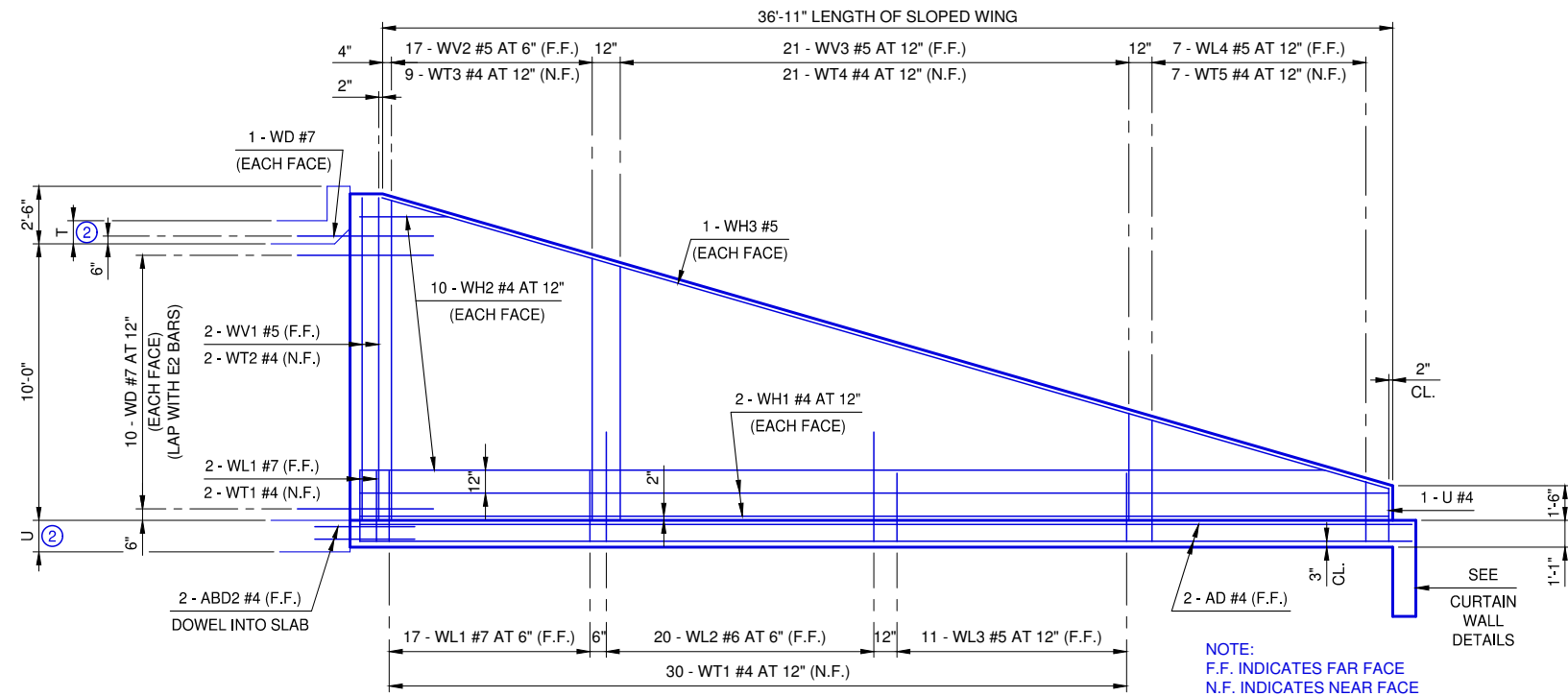
SHEET NO. 1 OF 2

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Drawing Number  
 RCB-030

REVISION NO.

DATE



**WINGWALL ELEVATION**

NOTE:  
F.F. INDICATES FAR FACE  
N.F. INDICATES NEAR FACE

**ADJUSTMENT IN NUMBER OF BARREL BARS IN END SECTION**

SPAN	BAR MARKS					
	A1	A2	B1	B2	C1	C2
10'					+2	+2
11'					+2	+2
12'					+2	+2

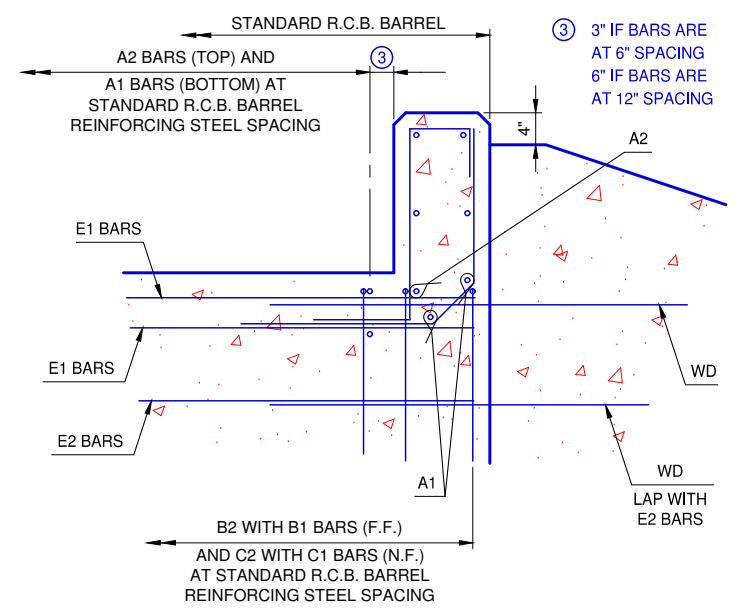
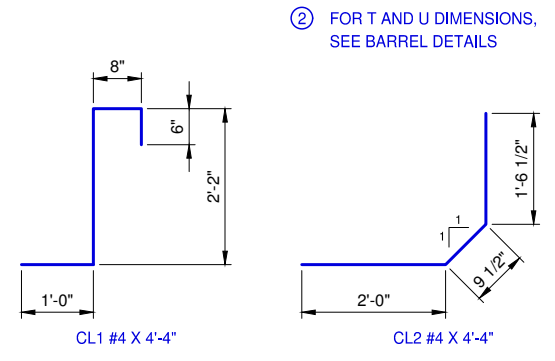
NOTE:  
TO CONSTRUCT ONE END SECTION AS SHOWN, THE NUMBER OF BARS SHOWN NEED TO BE ADDED TO OR SUBTRACTED FROM THE TOTAL WEIGHT OF REINFORCING FOR THE BARREL. THIS WEIGHT ADJUSTMENT IS INCLUDED IN THE END SECTION QUANTITY. SEE BARREL DETAILS FOR BAR LENGTHS, SIZES AND BENDS.

**WINGWALL BAR LIST**  
ONE WINGWALL SHOWN, TWO REQUIRED

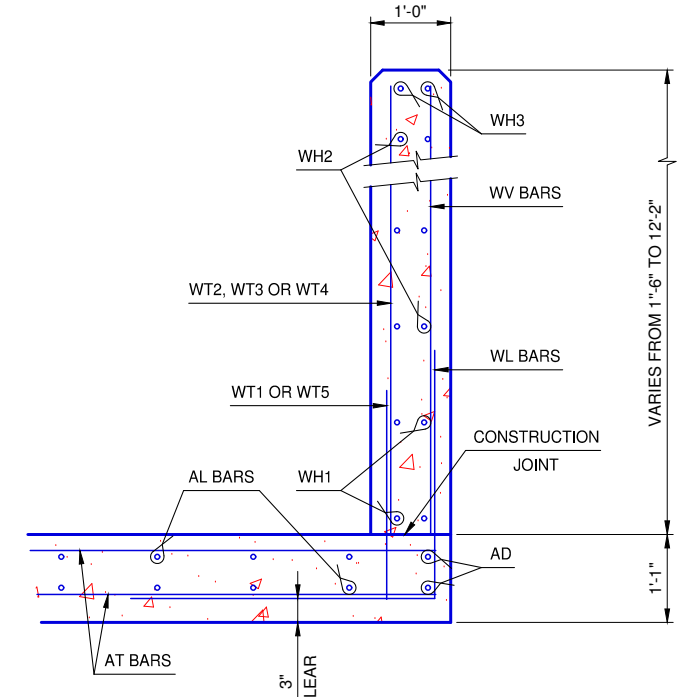
MARK	SIZE	NO.	FORM	LENGTH	LENGTH VARIATION
WD	#7	22	BNT.	6'-8"	
WH1	#4	4	STR.	37'-9"	
WH2	#4	20	STR.	19'-4" AVG.	3'-9" TO 34'-11"
WH3	#5	2	STR.	38'-3"	
WL1	#7	19	BNT.	14'-2"	
WL2	#6	20	BNT.	14'-6"	
WL3	#5	11	BNT.	6'-2"	
WL4	#5	7	BNT.	6'-3" AVG.	5'-5" TO 7'-1"
WT1	#4	32	STR.	2'-6"	
WT2	#4	2	STR.	12'-0"	
WT3	#4	9	STR.	10'-8" AVG.	9'-6" TO 11'-10"
WT4	#4	21	STR.	6'-4" AVG.	3'-5" TO 9'-3"
WT5	#4	7	STR.	3'-1" AVG.	2'-3" TO 3'-11"
WV1	#5	2	STR.	12'-0"	
WV2	#5	17	STR.	10'-8" AVG.	9'-6" TO 11'-10"
WV3	#5	21	STR.	6'-4" AVG.	3'-5" TO 9'-3"
U	#4	1	BNT.	5'-1"	

① 2 SETS OF 10 BARS

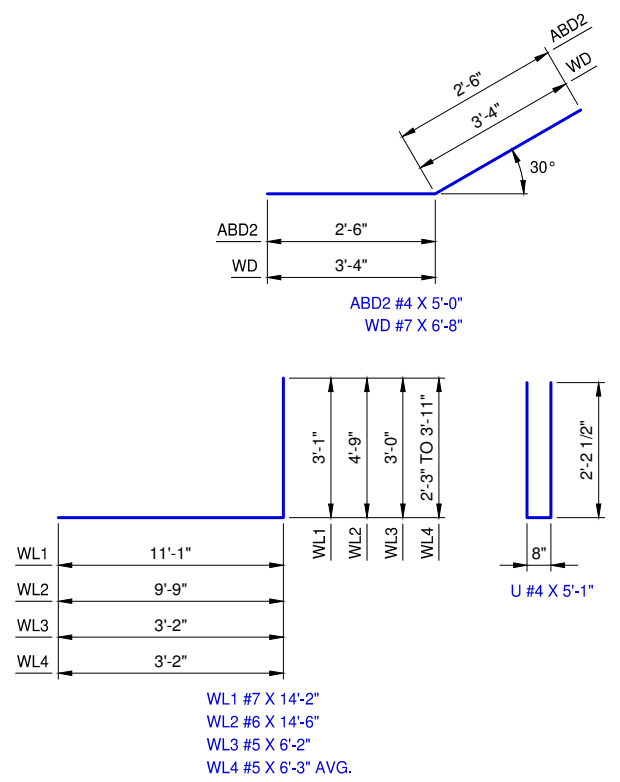
SEE STD. RCB-015 PipeRailing FOR DETAILS OF RAIL REQUIRED ON TOP OF HEADWALL AND WINGS



**HEADWALL DETAIL AT EXTERIOR WALL**



**TYPICAL SECTION THRU WING**



**HEADWALL DETAIL AT MIDSPAN**

REVISION NO. \_\_\_\_\_  
DATE \_\_\_\_\_

APPROVED BY: DATE: 6/22/2023  
ERIC J. WENGER, P.E.  
CITY ENGINEER  
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**R.C.B. CULVERTS - END SECTION DETAILS**  
SINGLE CELL - 10' HEIGHT - 0° SKEW  
SHEET NO. 2 OF 2

Drawing Number  
RCB-031