

### APRON AND HEADWALL BAR LIST

MARK	SIZE	FORM	4' SPAN			5' SPAN			6' SPAN			7' SPAN			8' SPAN			9' SPAN			10' SPAN			11' SPAN		
			NO.	LENGTH	LENGTH VARIATION	NO.	LENGTH	LENGTH VARIATION	NO.	LENGTH	LENGTH VARIATION	NO.	LENGTH	LENGTH VARIATION	NO.	LENGTH	LENGTH VARIATION	NO.	LENGTH	LENGTH VARIATION	NO.	LENGTH	LENGTH VARIATION	NO.	LENGTH	LENGTH VARIATION
ABD1	#4	STR.	12	4'-3"		14	4'-3"		16	4'-3"		18	4'-3"		20	4'-3"		22	4'-3"		24	4'-3"		26	4'-3"	
ABD2	#4	BNT.	4	5'-0"		4	5'-0"		4	5'-0"		4	5'-0"		4	5'-0"		4	5'-0"		4	5'-0"		4	5'-0"	
AD	#4	STR.	4	13'-3"		4	13'-3"		4	13'-3"		4	13'-3"		4	13'-3"		4	13'-3"		4	13'-3"		4	13'-3"	
AL1	#4	STR.	12	12'-7"		14	12'-7"		16	12'-7"		18	12'-7"		20	12'-7"		22	12'-7"		24	12'-7"		26	12'-7"	
AL2	#4	STR.	24	6'-7" AVG.	2'-4" TO 10'-10"	24	6'-7" AVG.	2'-4" TO 10'-10"	24	6'-7" AVG.	2'-4" TO 10'-10"	24	6'-7" AVG.	2'-4" TO 10'-10"	24	6'-7" AVG.	2'-4" TO 10'-10"	24	6'-7" AVG.	2'-4" TO 10'-10"	24	6'-7" AVG.	2'-4" TO 10'-10"	24	6'-7" AVG.	2'-4" TO 10'-10"
AT1	#4	STR.	4	18'-3"		4	19'-3"		4	20'-3"		4	21'-3"		4	22'-3"		4	23'-9"		4	24'-9"		4	25'-9"	
AT2	#4	STR.	12	11'-3" AVG.	4'-10" TO 17'-8"	12	12'-3" AVG.	5'-10" TO 18'-8"	12	13'-3" AVG.	6'-10" TO 19'-8"	12	14'-3" AVG.	7'-10" TO 20'-8"	12	15'-3" AVG.	8'-10" TO 21'-8"	12	16'-9" AVG.	10'-4" TO 23'-2"	12	17'-9" AVG.	11'-4" TO 24'-2"	12	18'-9" AVG.	12'-4" TO 25'-2"
AT3	#5	STR.	12	11'-3" AVG.	4'-10" TO 17'-8"	12	12'-3" AVG.	5'-10" TO 18'-8"	12	13'-3" AVG.	6'-10" TO 19'-8"	12	14'-3" AVG.	7'-10" TO 20'-8"	12	15'-3" AVG.	8'-10" TO 21'-8"	12	16'-9" AVG.	10'-4" TO 23'-2"	12	17'-9" AVG.	11'-4" TO 24'-2"	12	18'-9" AVG.	12'-4" TO 25'-2"
CH	#4	STR.	4	4'-10"		4	5'-10"		4	6'-10"		4	7'-10"		4	8'-10"		4	10'-4"		4	11'-4"		4	12'-4"	
CL1	#4	BNT.	6	4'-4"		7	4'-4"		8	4'-4"		9	4'-4"		10	4'-4"		13	4'-4"		14	4'-4"		15	4'-4"	
CL2	#4	BNT.	6	4'-4"		7	4'-4"		8	4'-4"		9	4'-4"		10	4'-4"		13	4'-4"		14	4'-4"		15	4'-4"	

① 4 SETS OF 6 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

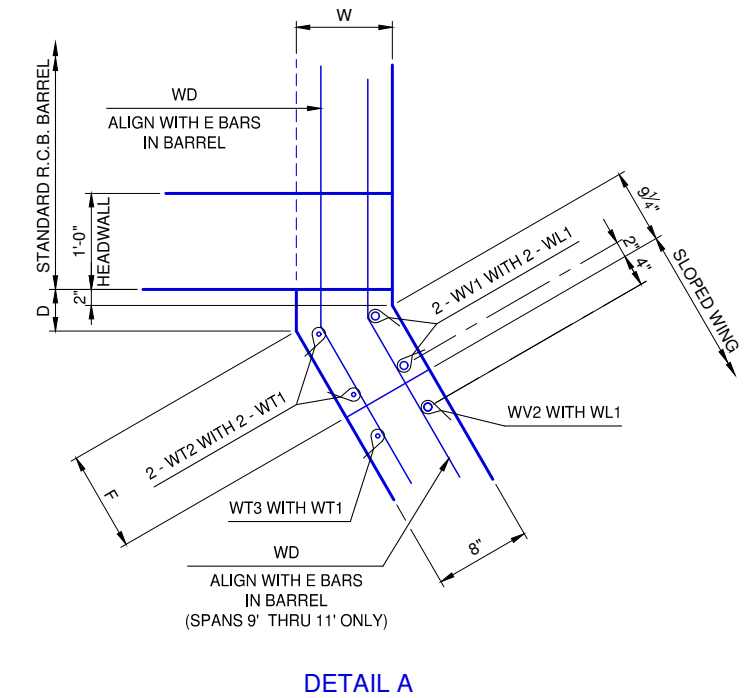
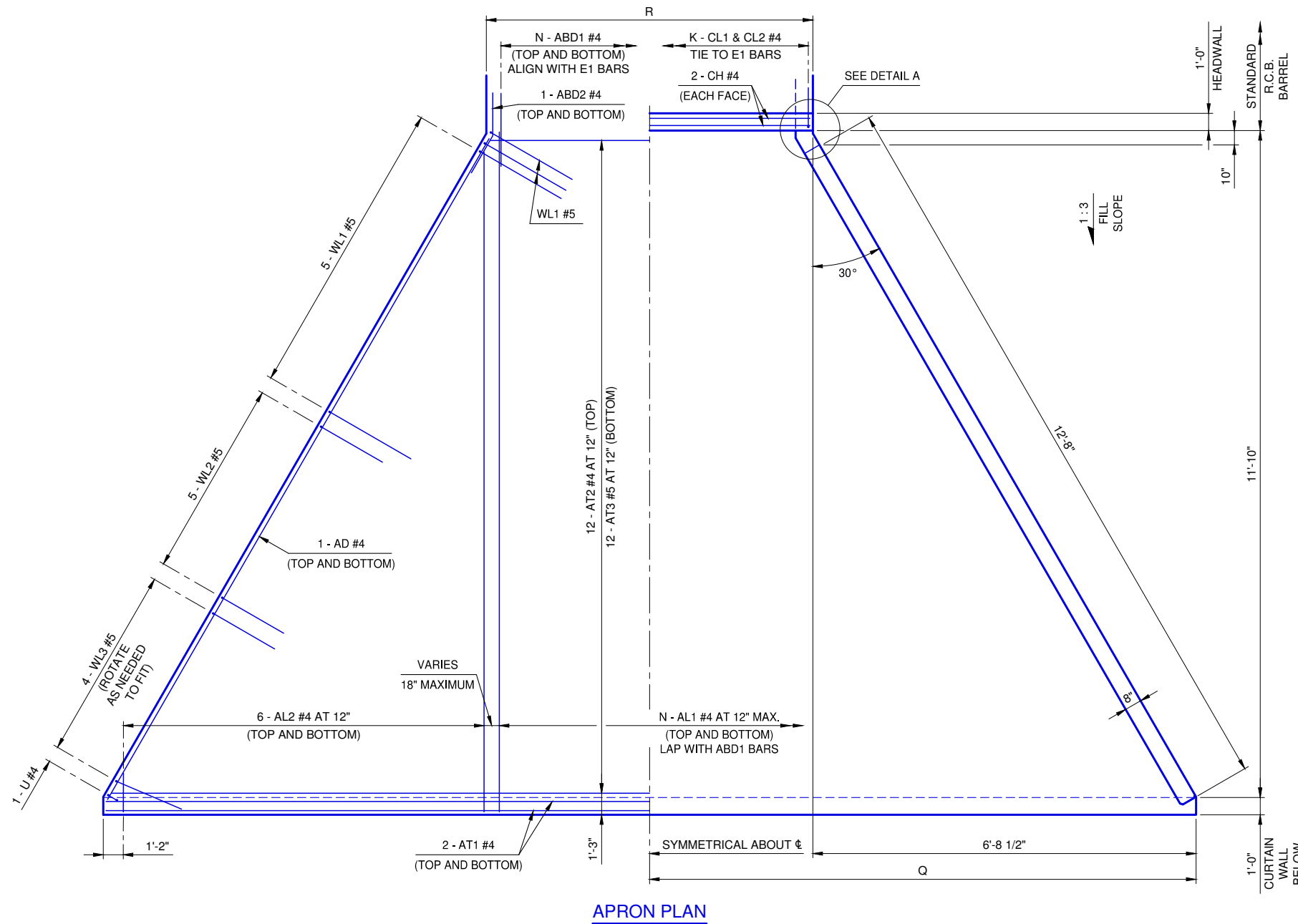
ITEM	UNIT	4' SPAN	5' SPAN	6' SPAN	7' SPAN	8' SPAN	9' SPAN	10' SPAN	11' SPAN
CLASS AA CONCRETE	C.Y.	7.1	7.6	8.0	8.4	8.8	9.4	9.8	10.2
REINFORCING STEEL	L.B.	1,290	1,350	1,400	1,450	1,510	1,630	1,680	1,740
PIPE RAILING	L.F.	32	33	34	35	36	38	39	40

#### APRON VARIABLES

SPAN	DIMENSIONS			NO. OF BARS	
	R	Q	K	N	
4'	5'-2"	9'-3 1/2"	6	6	
5'	6'-2"	9'-9 1/2"	7	7	
6'	7'-2"	10'-3 1/2"	8	8	
7'	8'-2"	10'-9 1/2"	9	9	
8'	9'-2"	11'-3 1/2"	10	10	
9'	10'-8"	12'-0 1/2"	13	11	
10'	11'-8"	12'-6 1/2"	14	12	
11'	12'-8"	13'-0 1/2"	15	13	

#### WINGWALL DIMENSIONS

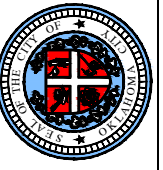
SPAN	W	D	F
4'	7"	5 7/8"	9 3/8"
5'	7"	5 7/8"	9 3/8"
6'	7"	5 7/8"	9 3/8"
7'	7"	5 7/8"	9 3/8"
8'	7"	5 7/8"	9 3/8"
9'	10"	11/16"	1'-3 3/8"
10'	10"	11/16"	1'-3 3/8"
11'	10"	11/16"	1'-3 3/8"



DETAIL A

REVISION NO.
DATE

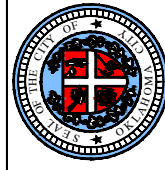
The City of  
**Oklahoma City**  
 Public Works Department  
 Engineering Division



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.

**R.C.B. CULVERTS - END SECTION DETAILS**  
**SINGLE CELL - 3' HEIGHT - 0° SKEW**  
 SHEET NO. 1 OF 2

Drawing Number  
 RCB-016

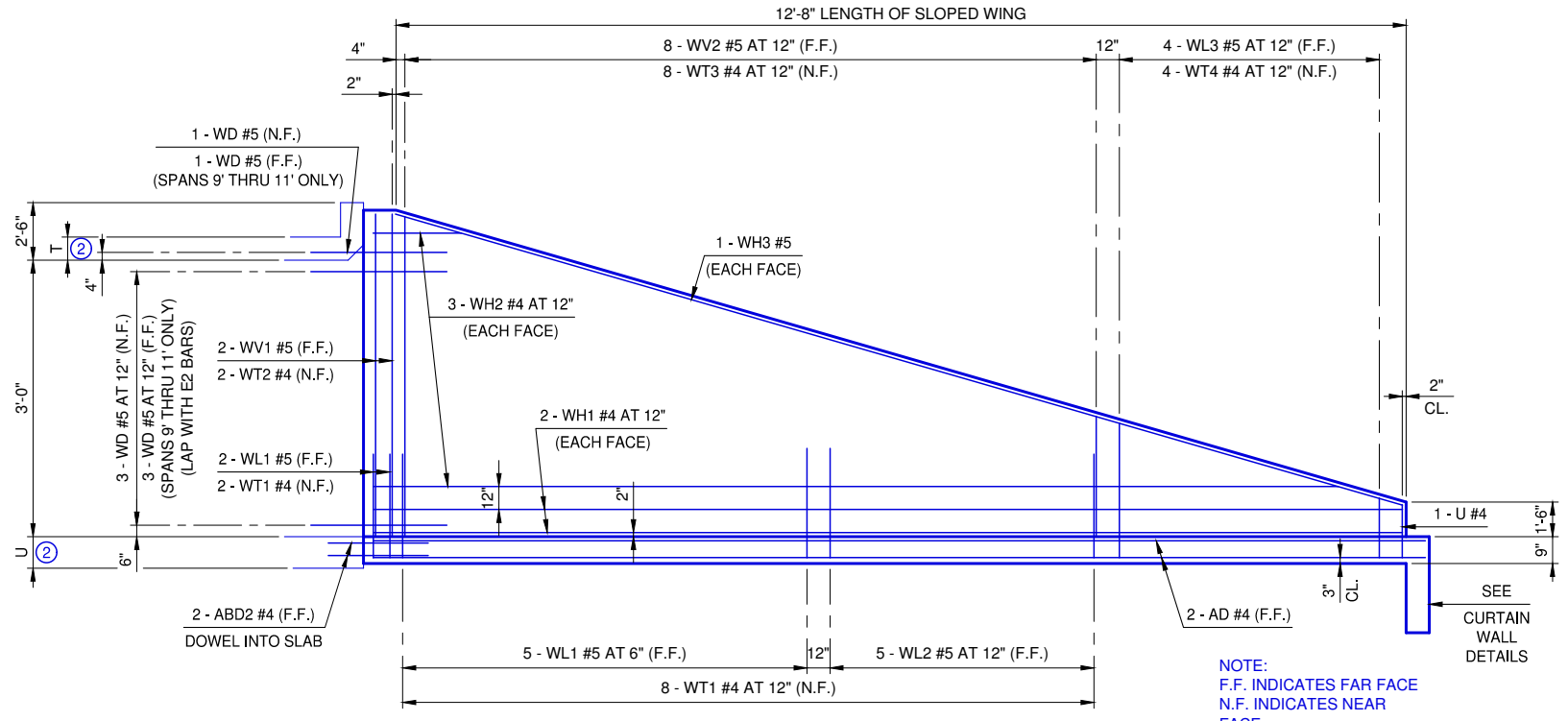


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**R.C.B. CULVERTS - END SECTION DETAILS**  
**SINGLE CELL - 3' HEIGHT - 0° SKEW**  
SHEET NO. 2 OF 2

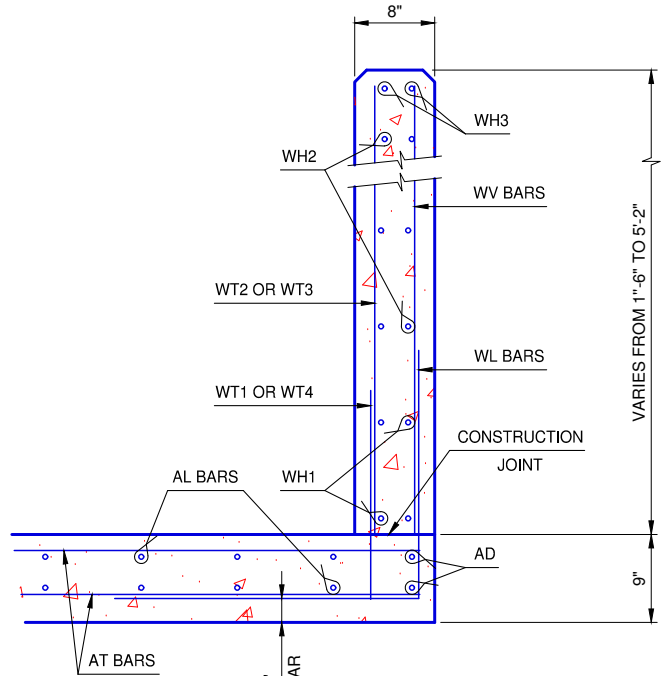
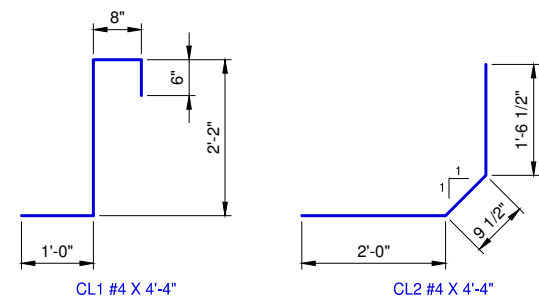
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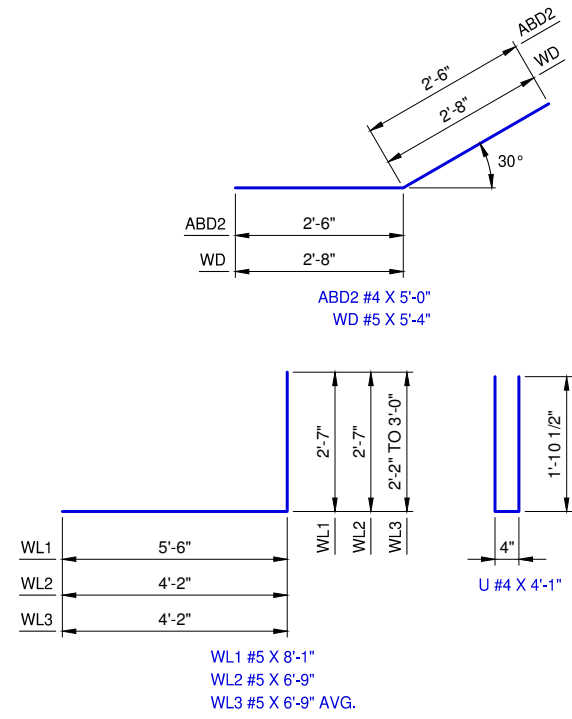
**WINGWALL ELEVATION**

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

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



**TYPICAL SECTION THRU WING**



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

SPAN	BAR MARKS					
	A1	A2	B1	B2	C1	C2
4'	+1		+2	+2		
5'	+1		+2	+2		
6'			+2	+2		
7'			+2	+2		
8'			+2	+2		
9'					+2	+2
10'					+2	+2
11'					+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.

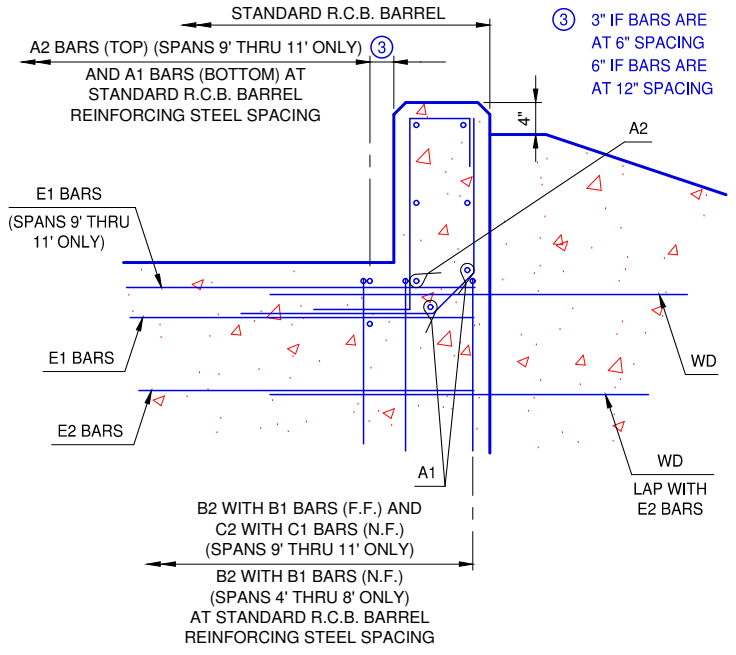
**WINGWALL BAR LIST**

ONE WINGWALL SHOWN, TWO REQUIRED					
MARK	SIZE	NO.	FORM	LENGTH	LENGTH VARIATION
WD	#5	4	BNT.	5'-4"	
WH1	#4	4	STR.	13'-3"	
WH2	#4	6	STR.	7'-0" AVG.	3'-7" TO 10'-5"
WH3	#5	2	STR.	13'-0"	
WL1	#5	7	BNT.	8'-1"	
WL2	#5	5	BNT.	6'-9"	
WL3	#5	4	BNT.	6'-9" AVG.	6'-4" TO 7'-2"
WT1	#4	10	STR.	2'-2"	
WT2	#4	2	STR.	5'-0"	
WT3	#4	8	STR.	3'-10" AVG.	2'-10" TO 4'-10"
WT4	#4	4	STR.	2'-7" AVG.	2'-2" TO 3'-0"
WV1	#5	2	STR.	5'-0"	
WV2	#5	8	STR.	3'-10" AVG.	2'-10" TO 4'-10"
U	#4	1	BNT.	4'-1"	

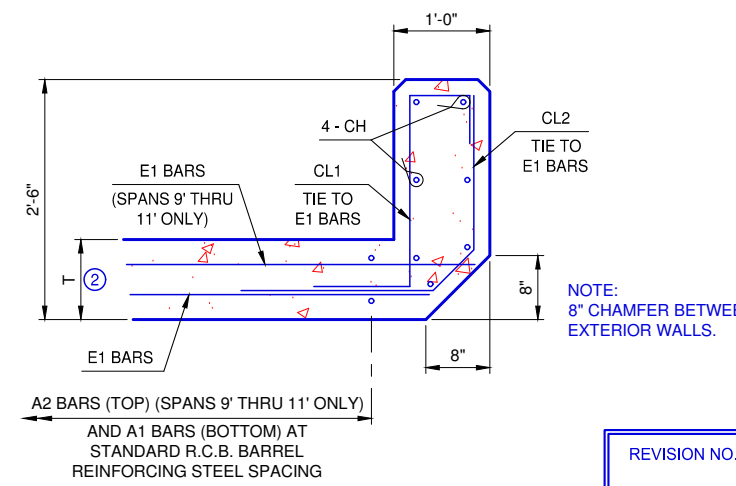
ADDITIONAL BARS REQUIRED IN 9', 10' AND 11' SPANS  
ONE WINGWALL SHOWN, TWO REQUIRED

WD	#5	4	BNT.	5'-4"	
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① 2 SETS OF 3 BARS



**HEADWALL DETAIL AT EXTERIOR WALL**



**HEADWALL DETAIL AT MIDSPAN**

REVISION NO.  
DATE