

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	16'-9"		4	16'-9"		4	16'-9"		4	16'-9"		4	16'-9"		4	16'-9"		4	16'-9"		4	16'-9"	
AL1	#4	STR.	12	15'-7"		14	15'-7"		16	15'-7"		18	15'-7"		20	15'-7"		22	15'-7"		24	15'-7"		26	15'-7"	
AL2	#4	STR.	32	8'-3" AVG.	2'-3" TO 14'-3"	32	8'-3" AVG.	2'-3" TO 14'-3"	32	8'-3" AVG.	2'-3" TO 14'-3"	32	8'-3" AVG.	2'-3" TO 14'-3"	32	8'-3" AVG.	2'-3" TO 14'-3"	32	8'-3" AVG.	2'-3" TO 14'-3"	32	8'-3" AVG.	2'-3" TO 14'-3"	32	8'-3" AVG.	2'-3" TO 14'-3"
AT1	#4	STR.	4	21'-9"		4	22'-9"		4	23'-9"		4	24'-9"		4	25'-9"		4	27'-3"		4	28'-3"		4	29'-3"	
AT2	#4	STR.	15	13'-0" AVG.	4'-11" TO 21'-1"	15	14'-0" AVG.	5'-11" TO 22'-1"	15	15'-0" AVG.	6'-11" TO 23'-1"	15	16'-0" AVG.	7'-11" TO 24'-1"	15	17'-0" AVG.	8'-11" TO 25'-1"	15	18'-6" AVG.	10'-5" TO 26'-7"	15	19'-6" AVG.	11'-5" TO 27'-7"	15	20'-6" AVG.	12'-5" TO 28'-7"
AT3	#5	STR.	15	13'-0" AVG.	4'-11" TO 21'-1"	15	14'-0" AVG.	5'-11" TO 22'-1"	15	15'-0" AVG.	6'-11" TO 23'-1"	15	16'-0" AVG.	7'-11" TO 24'-1"	15	17'-0" AVG.	8'-11" TO 25'-1"	15	18'-6" AVG.	10'-5" TO 26'-7"	15	19'-6" AVG.	11'-5" TO 27'-7"	15	20'-6" AVG.	12'-5" TO 28'-7"
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"	

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① 4 SETS OF 8 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

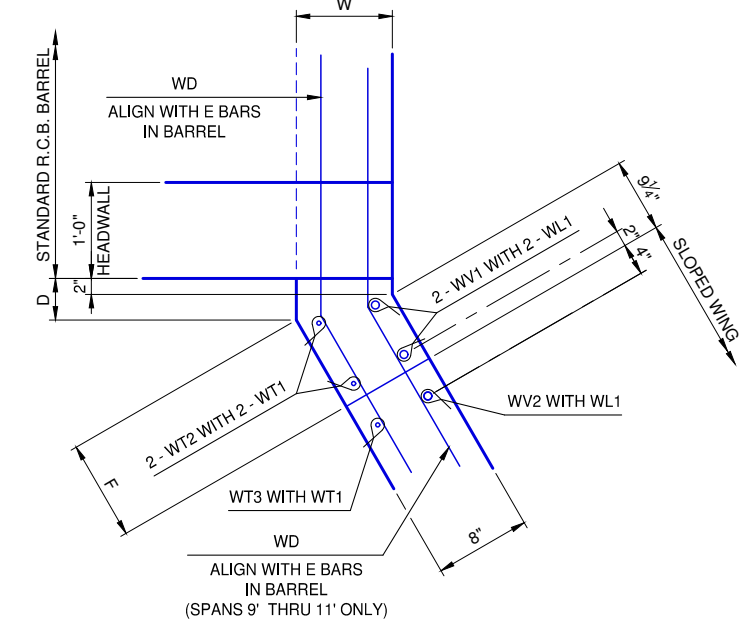
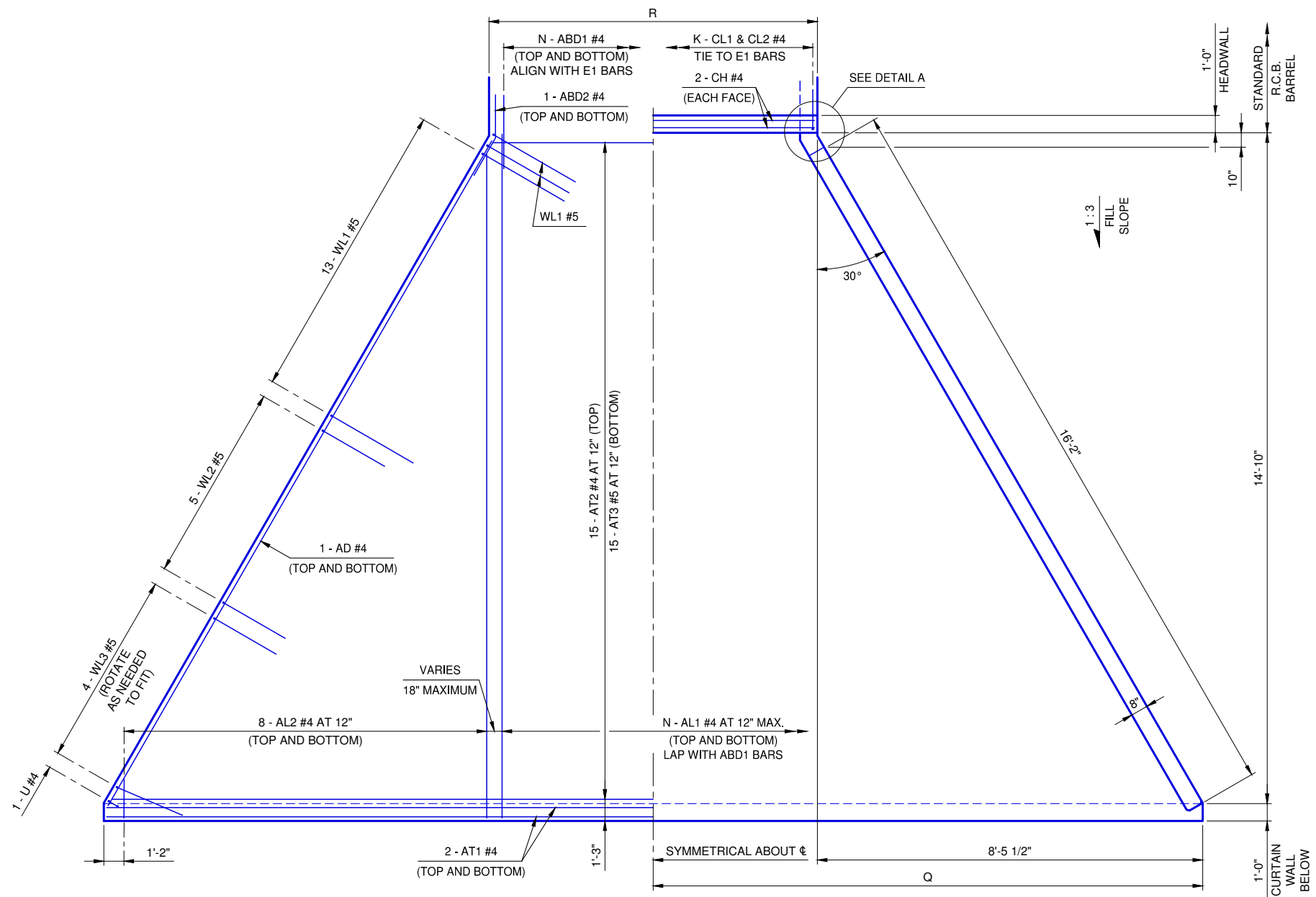
ITEM	UNIT	4' SPAN	5' SPAN	6' SPAN	7' SPAN	8' SPAN	9' SPAN	10' SPAN	11' SPAN
CLASS AA CONCRETE	C.Y.	10.6	11.2	11.8	12.3	12.8	13.7	14.2	14.7
REINFORCING STEEL	LB.	1,820	1,890	1,940	2,000	2,070	2,210	2,270	2,340
PIPE RAILING	L.F.	39	40	41	42	43	45	46	47

APRON VARIABLES

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

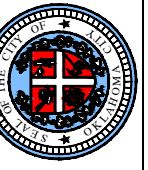
WINGWALL DIMENSIONS

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"



REVISION NO.
DATE


The City of
Oklahoma City
Public Works Department
Engineering Division



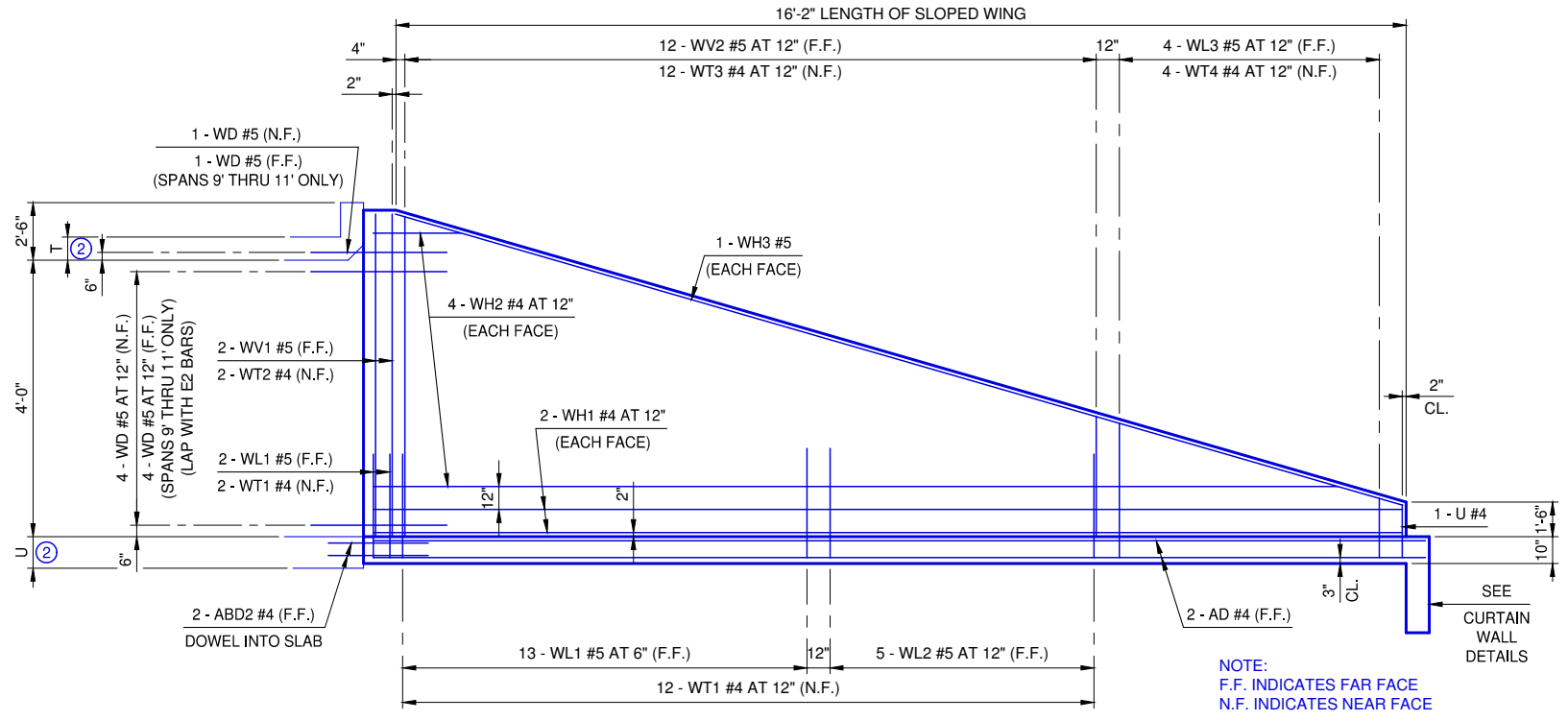
APPROVED BY: [Signature]
ERIC J. WENGER, P.E.
CITY ENGINEER

R.C.B. CULVERTS - END SECTION DETAILS
SINGLE CELL - 4' HEIGHT - 0° SKEW
SHEET NO. 1 OF 2

Drawing Number
RCB-018

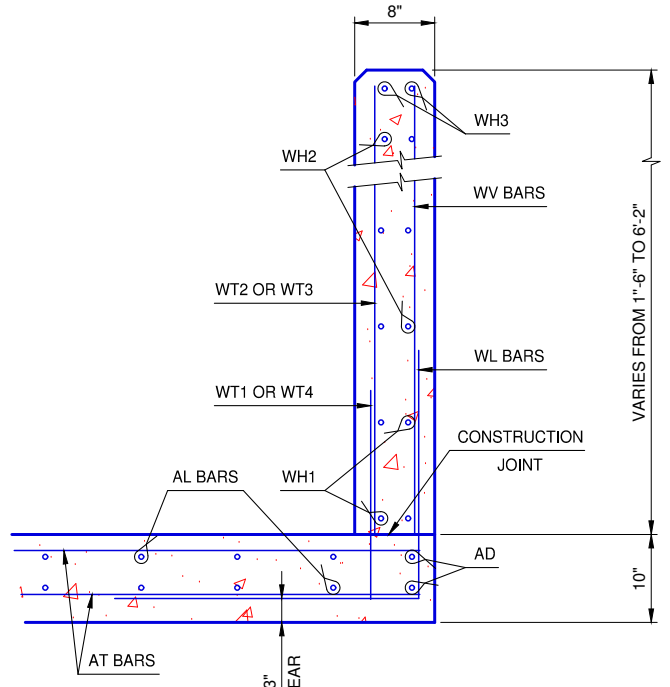
APPROVED BY:  DATE: 6/22/2023
ERIC J. WENGER, P.E.
CITY ENGINEER

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

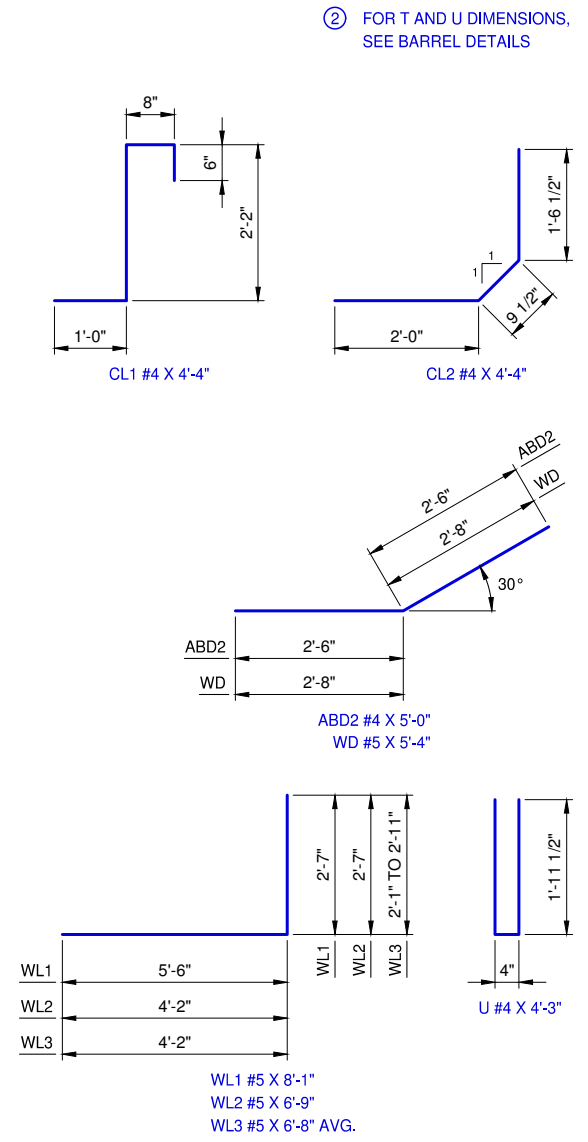


WINGWALL ELEVATION

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



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.

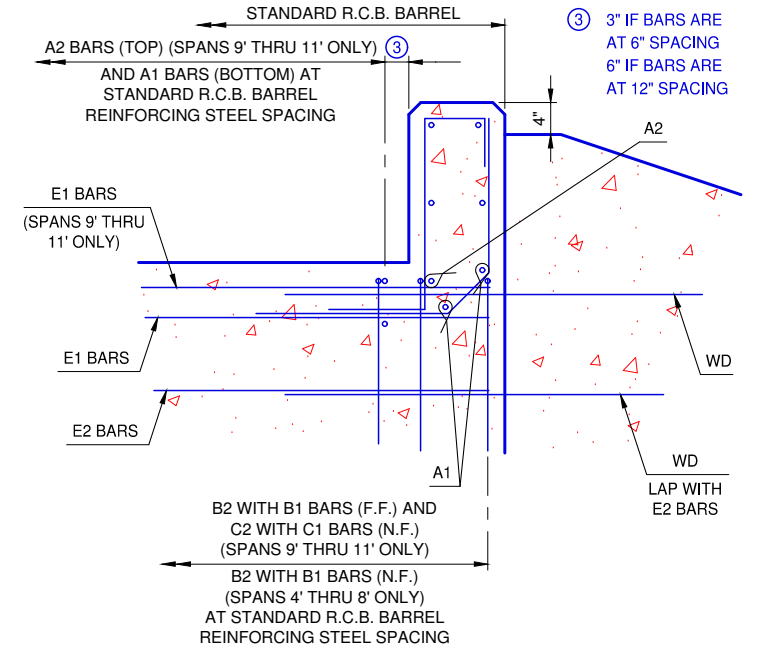
WINGWALL BAR LIST
ONE WINGWALL SHOWN, TWO REQUIRED

MARK	SIZE	NO.	FORM	LENGTH	LENGTH VARIATION
WD	#5	5	BNT.	5'-4"	
WH1	#4	4	STR.	16'-9"	
WH2	#4	8	STR.	8'-9" AVG.	3'-7" TO 13'-11"
WH3	#5	2	STR.	16'-9"	
WL1	#5	15	BNT.	8'-1"	
WL2	#5	5	BNT.	6'-9"	
WL3	#5	4	BNT.	6'-8" AVG.	6'-3" TO 7'-1"
WT1	#4	14	STR.	2'-3"	
WT2	#4	2	STR.	6'-0"	
WT3	#4	12	STR.	4'-3" AVG.	2'-8" TO 5'-10"
WT4	#4	4	STR.	2'-6" AVG.	2'-1" TO 2'-11"
WV1	#5	2	STR.	6'-0"	
WV2	#5	12	STR.	4'-3" AVG.	2'-8" TO 5'-10"
U	#4	1	BNT.	4'-3"	

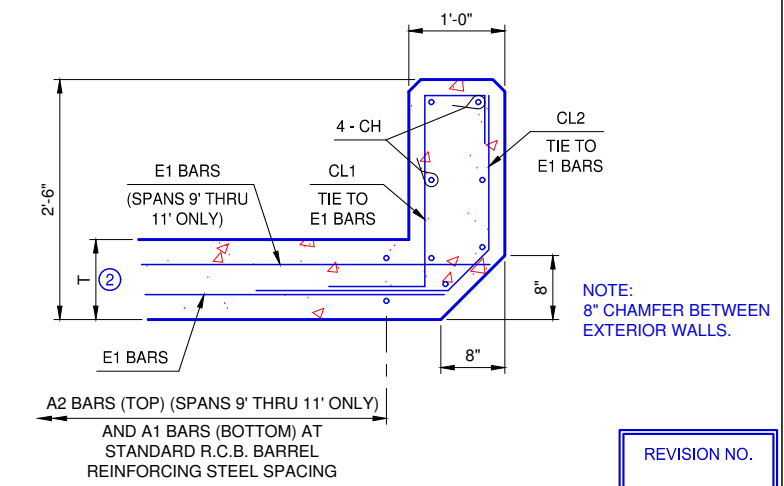
ADDITIONAL BARS REQUIRED IN 9', 10' AND 11' SPANS
ONE WINGWALL SHOWN, TWO REQUIRED

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



HEADWALL DETAIL AT EXTERIOR WALL



HEADWALL DETAIL AT MIDSPAN

REVISION NO.

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