

### 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.	36	4'-3"		42	4'-3"		48	4'-3"		54	4'-3"		60	4'-3"		66	4'-3"		72	4'-3"		78	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.	36	15'-7"		42	15'-7"		48	15'-7"		54	15'-7"		60	15'-7"		66	15'-7"		72	15'-7"		78	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	31'-11"		4	34'-11"		4	37'-11"		4	40'-11"		4	43'-11"		4	46'-11"		4	49'-11"		4	52'-11"	
AT2	#4	STR.	15	23'-2" AVG.	15'-0" TO 31'-4"	15	26'-2" AVG.	18'-0" TO 34'-4"	15	29'-2" AVG.	21'-0" TO 37'-4"	15	32'-2" AVG.	24'-0" TO 40'-4"	15	35'-2" AVG.	27'-0" TO 43'-4"	15	38'-2" AVG.	30'-0" TO 46'-4"	15	41'-2" AVG.	33'-0" TO 49'-4"	15	44'-2" AVG.	36'-0" TO 52'-4"
AT3	#5	STR.	15	23'-2" AVG.	15'-0" TO 31'-4"	15	26'-2" AVG.	18'-0" TO 34'-4"	15	29'-2" AVG.	21'-0" TO 37'-4"	15	32'-2" AVG.	24'-0" TO 40'-4"	15	35'-2" AVG.	27'-0" TO 43'-4"	15	38'-2" AVG.	30'-0" TO 46'-4"	15	41'-2" AVG.	33'-0" TO 49'-4"	15	44'-2" AVG.	36'-0" TO 52'-4"
CH	#4	STR.	4	15'-0"		4	18'-0"		4	21'-0"		4	24'-0"		4	27'-0"		4	30'-0"		4	33'-0"		4	36'-0"	
CL1	#4	BNT.	20	4'-4"		23	4'-4"		26	4'-4"		29	4'-4"		32	4'-4"		35	4'-4"		38	4'-4"		41	4'-4"	
CL2	#4	BNT.	20	4'-4"		23	4'-4"		26	4'-4"		29	4'-4"		32	4'-4"		35	4'-4"		38	4'-4"		41	4'-4"	

①

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

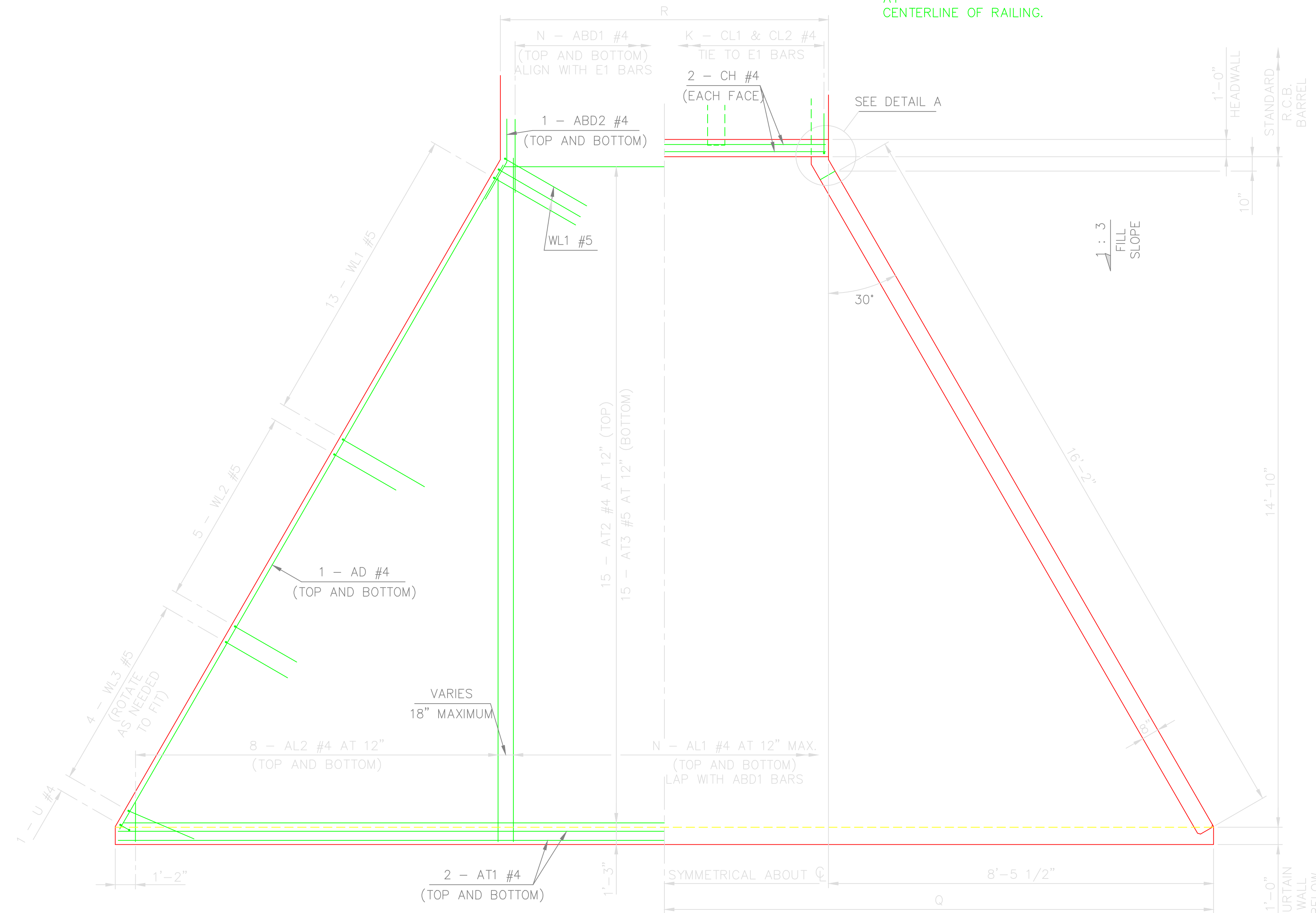
ITEM	UNIT	4' SPAN	5' SPAN	6' SPAN	7' SPAN	8' SPAN	9' SPAN	10' SPAN	11' SPAN
CLASS AA CONCRETE	C.Y.	16.4	18.0	19.7	21.3	23.0	24.5	26.2	27.7
REINFORCING STEEL	LB.	2,610	2,800	2,990	3,160	3,310	3,500	3,660	3,850
PIPE RAILING	L.F.	49	52	55	58	61	64	67	70

### APRON VARIABLES

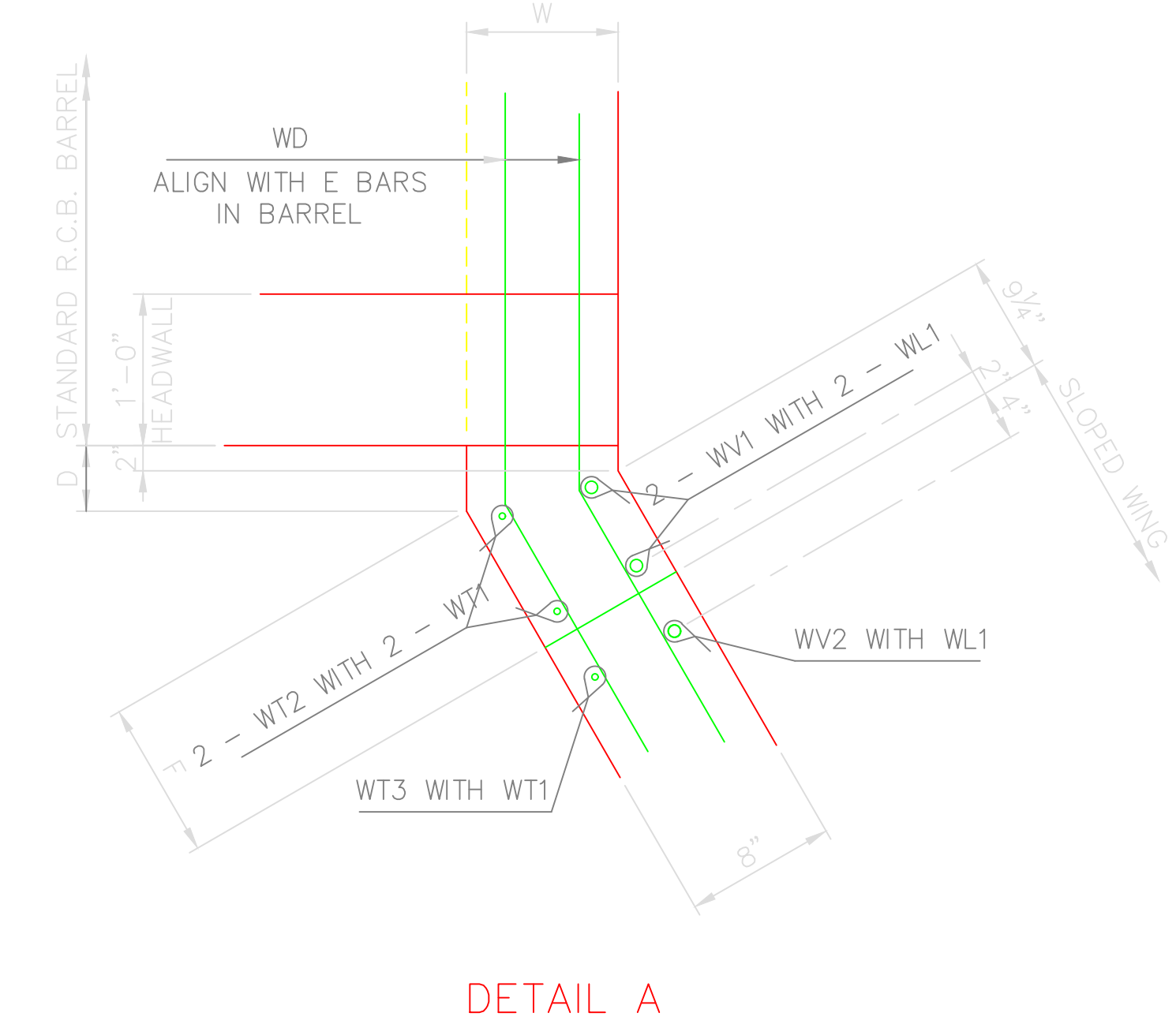
SPAN	DIMENSIONS		NO. OF BARS	
	R	Q	K	N
4'	15'-4"	16'-1 1/2"	20	18
5'	18'-4"	17'-7 1/2"	23	21
6'	21'-4"	19'-1 1/2"	26	24
7'	24'-4"	20'-7 1/2"	29	27
8'	27'-4"	22'-1 1/2"	32	30
9'	30'-4"	23'-7 1/2"	35	33
10'	33'-4"	25'-1 1/2"	38	36
11'	36'-4"	26'-7 1/2"	41	39

### WINGWALL DIMENSIONS

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

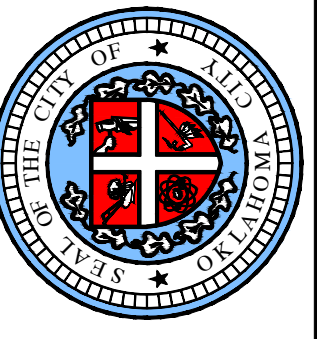


APRON PLAN



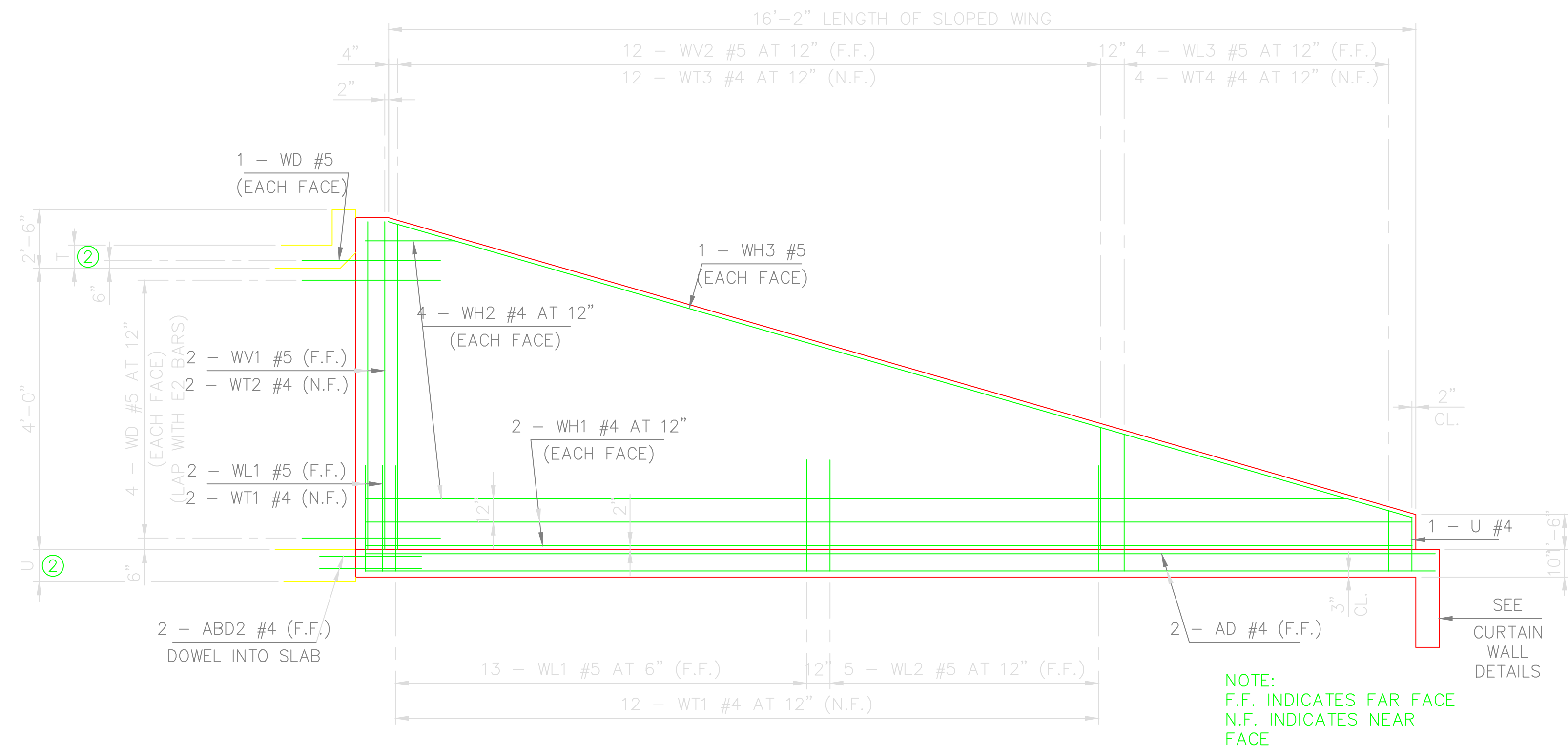
DETAIL A

REVISION NO.  
DATE



APPROVED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 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

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



WINGWALL ELEVATION

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

SPAN	BAR MARKS								
	A1	A2	A3	B1	B2	C1	C2	C3	C4
4'	+1	-1		+2	+2	+2	+2		
5'	+1	-1		+2	+2	+2	+2		
6'	+1			+2	+2	-4	-4	+2	+2
7'	+1					-4	-4	+2	+2
8'		-1				-4	-4	+2	+2
9'		-1				-4	-4	+2	+2
10'		-1				-4	-4	+2	+2
11'		-1				-4	-4	+2	+2

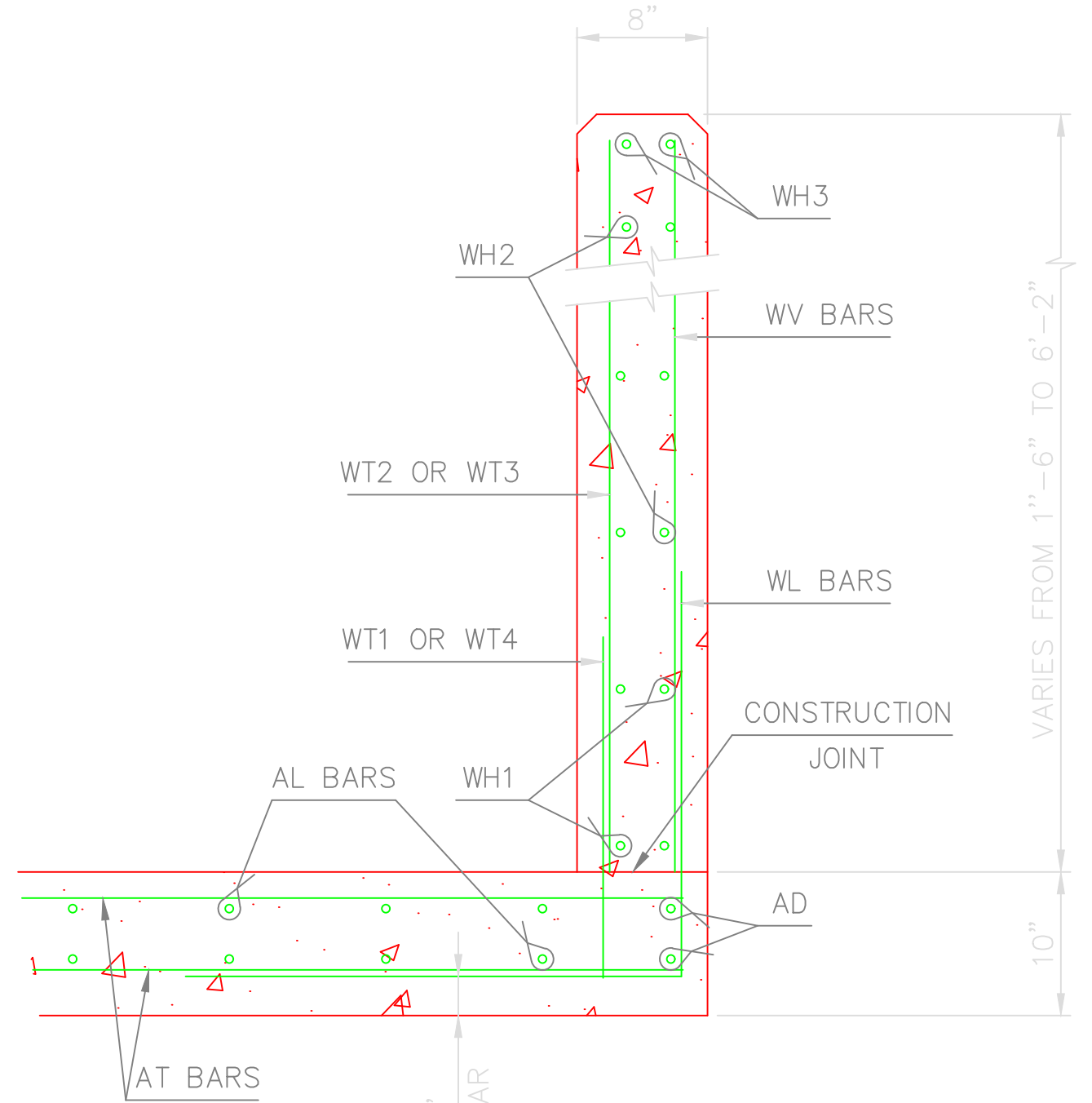
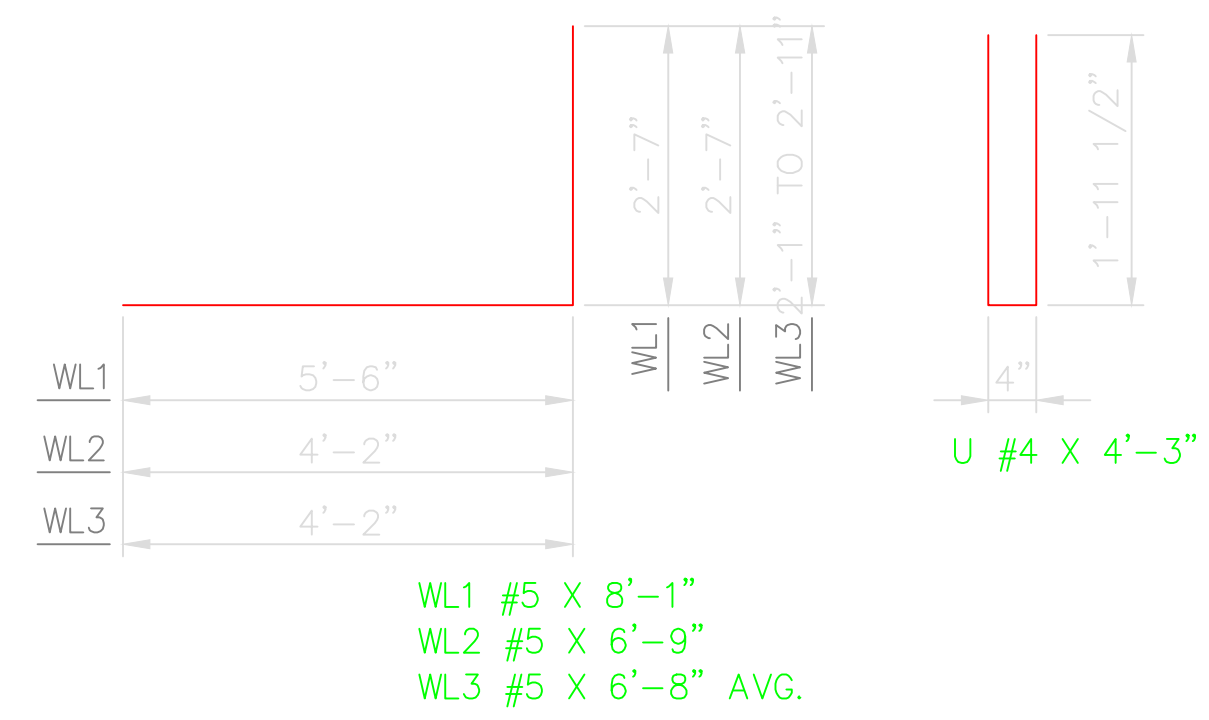
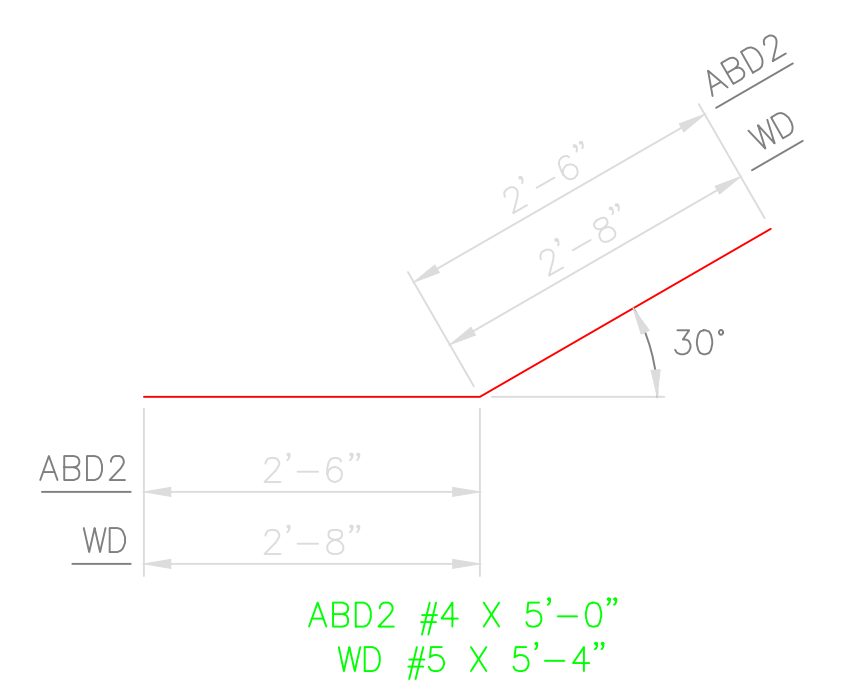
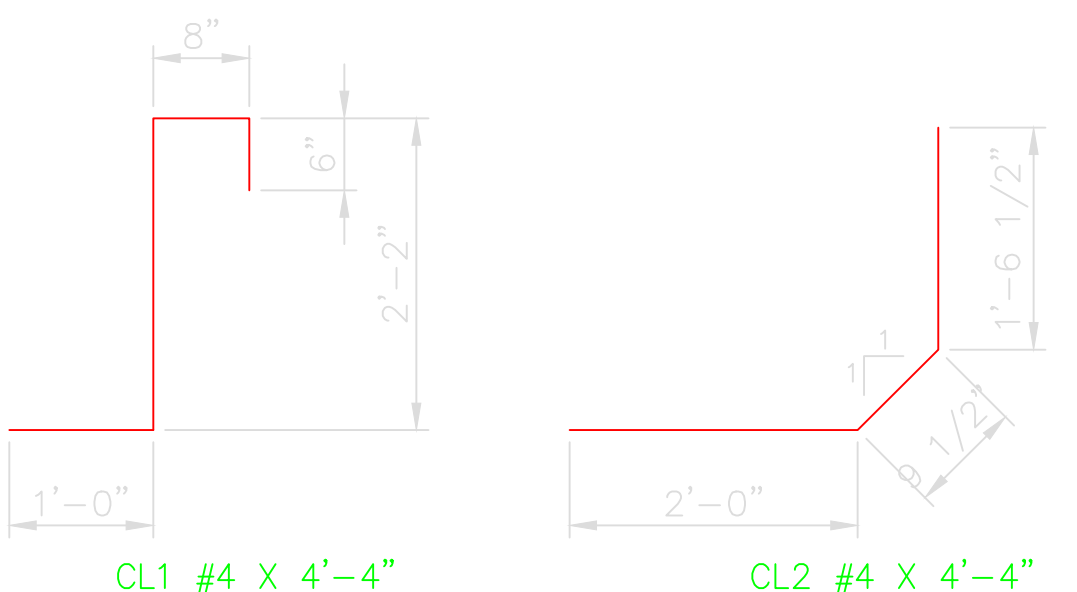
NOTE:  
TO CONSTRUCT ONE END SECTION AS SHOWN, THE NUMBER OF BARS SHOWN NEED TO BE ADDED TO OR SUBTRACTED FROM THE TOTAL WEIGHT OF REINFORCING FOR THE BARREL. THIS WEIGHT ADJUSTMENT IS INCLUDED IN THE END SECTION QUANTITY. SEE BARREL DETAILS FOR BAR LENGTHS, SIZES AND BENDS.

WINGWALL BAR LIST						
ONE WINGWALL SHOWN, TWO REQUIRED						
MARK	SIZE	NO.	FORM	LENGTH	LENGTH VARIATION	
WD	#5	10	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"		

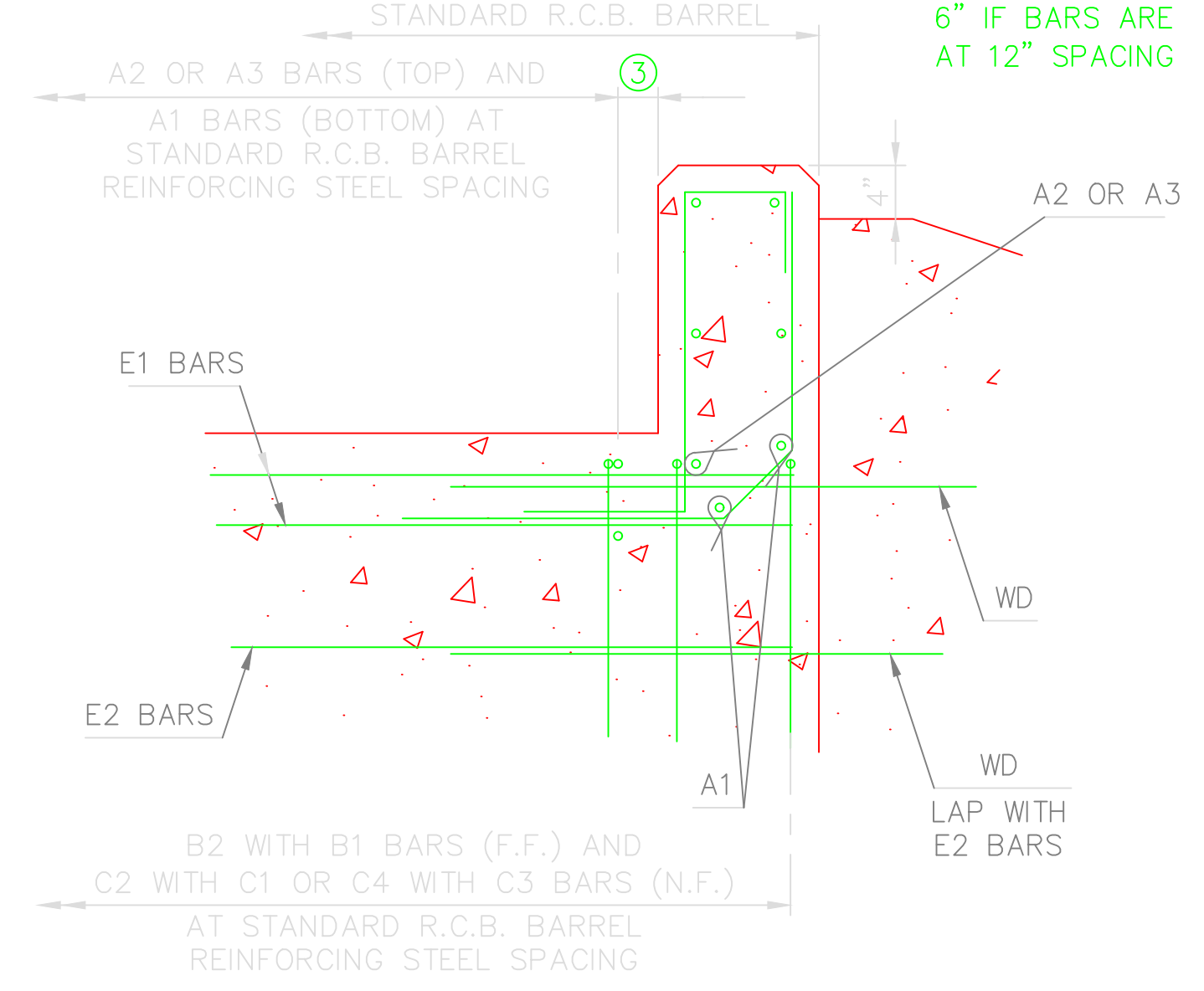
① 2 SETS OF 4 BARS

③ 3" IF BARS ARE AT 6" SPACING  
6" IF BARS ARE AT 12" SPACING

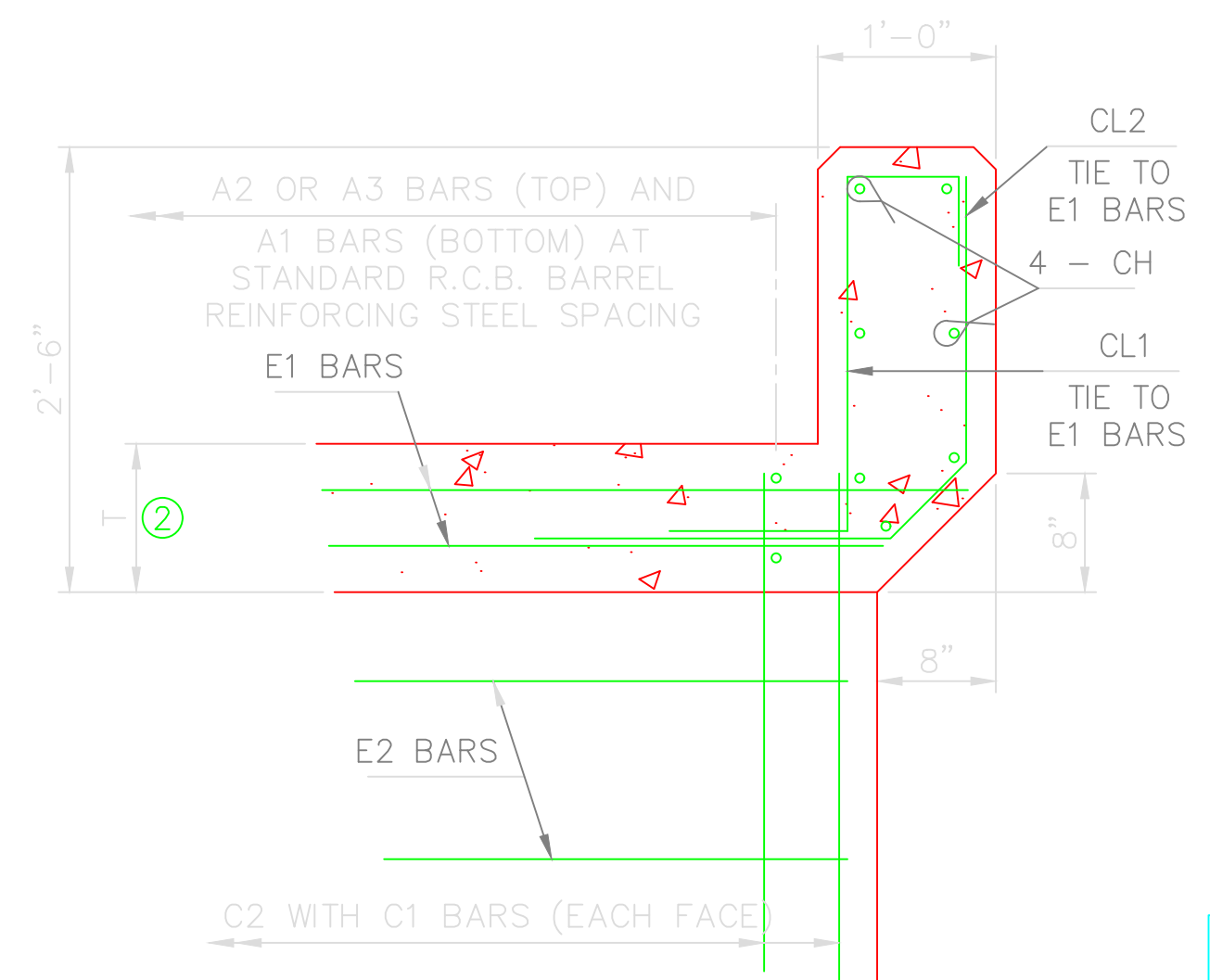
SEE STD. RCB-015 PipeRailing FOR DETAILS OF RAIL REQUIRED ON TOP OF HEADWALL AND WINGS



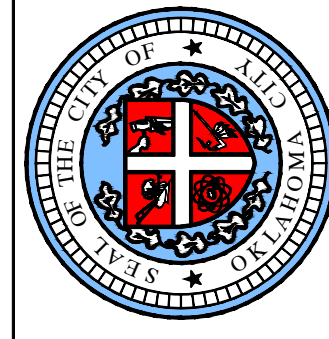
TYPICAL SECTION THRU WING



HEADWALL DETAIL AT EXTERIOR WALL



HEADWALL DETAIL AT INTERIOR WALL



APPROVED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
ERIC J. WENGER P.E.  
CITY ENGINEER  
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R.C.B. CULVERTS - END SECTION DETAILS  
TRIPLE CELL - 4' HEIGHT - 0° SKEW  
SHEET NO. 2 OF 2

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

Drawing Number RCB-067