

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	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.	36	12'-7"		42	12'-7"		48	12'-7"		54	12'-7"		60	12'-7"		66	12'-7"		72	12'-7"		78	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	28'-5"		4	31'-5"		4	34'-5"		4	37'-5"		4	40'-5"		4	43'-5"		4	46'-5"		4	49'-5"	
AT2	#4	STR.	12	21'-5" AVG.	15'-0" TO 27'-10"	12	24'-5" AVG.	18'-0" TO 30'-10"	12	27'-5" AVG.	21'-0" TO 33'-10"	12	30'-5" AVG.	24'-0" TO 36'-10"	12	33'-5" AVG.	27'-0" TO 39'-10"	12	36'-5" AVG.	30'-0" TO 42'-10"	12	39'-5" AVG.	33'-0" TO 45'-10"	12	42'-5" AVG.	36'-0" TO 48'-10"
AT3	#5	STR.	12	21'-5" AVG.	15'-0" TO 27'-10"	12	24'-5" AVG.	18'-0" TO 30'-10"	12	27'-5" AVG.	21'-0" TO 33'-10"	12	30'-5" AVG.	24'-0" TO 36'-10"	12	33'-5" AVG.	27'-0" TO 39'-10"	12	36'-5" AVG.	30'-0" TO 42'-10"	12	39'-5" AVG.	33'-0" TO 45'-10"	12	42'-5" AVG.	36'-0" TO 48'-10"
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

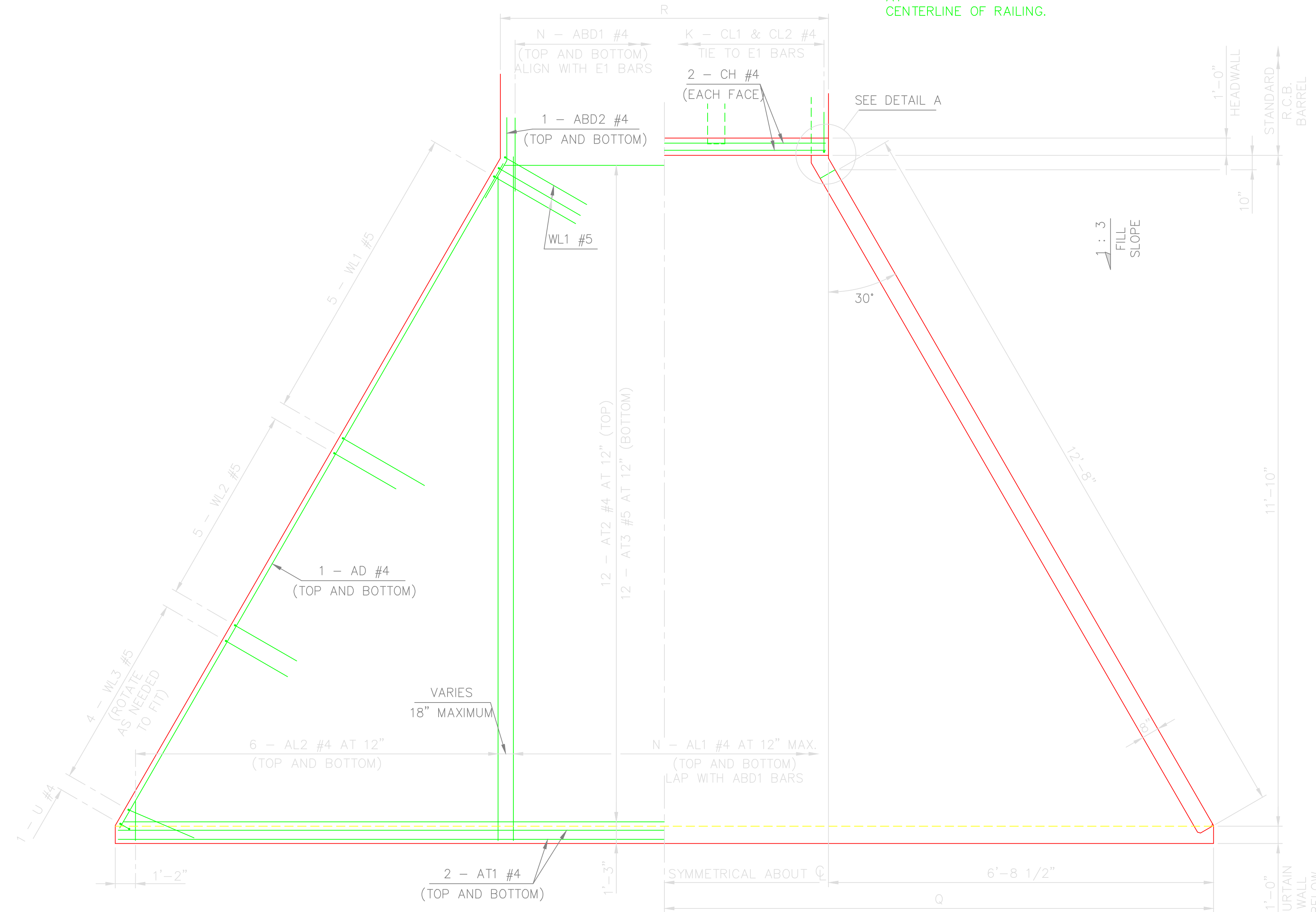
① - 4 SETS OF 6 BARS

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.

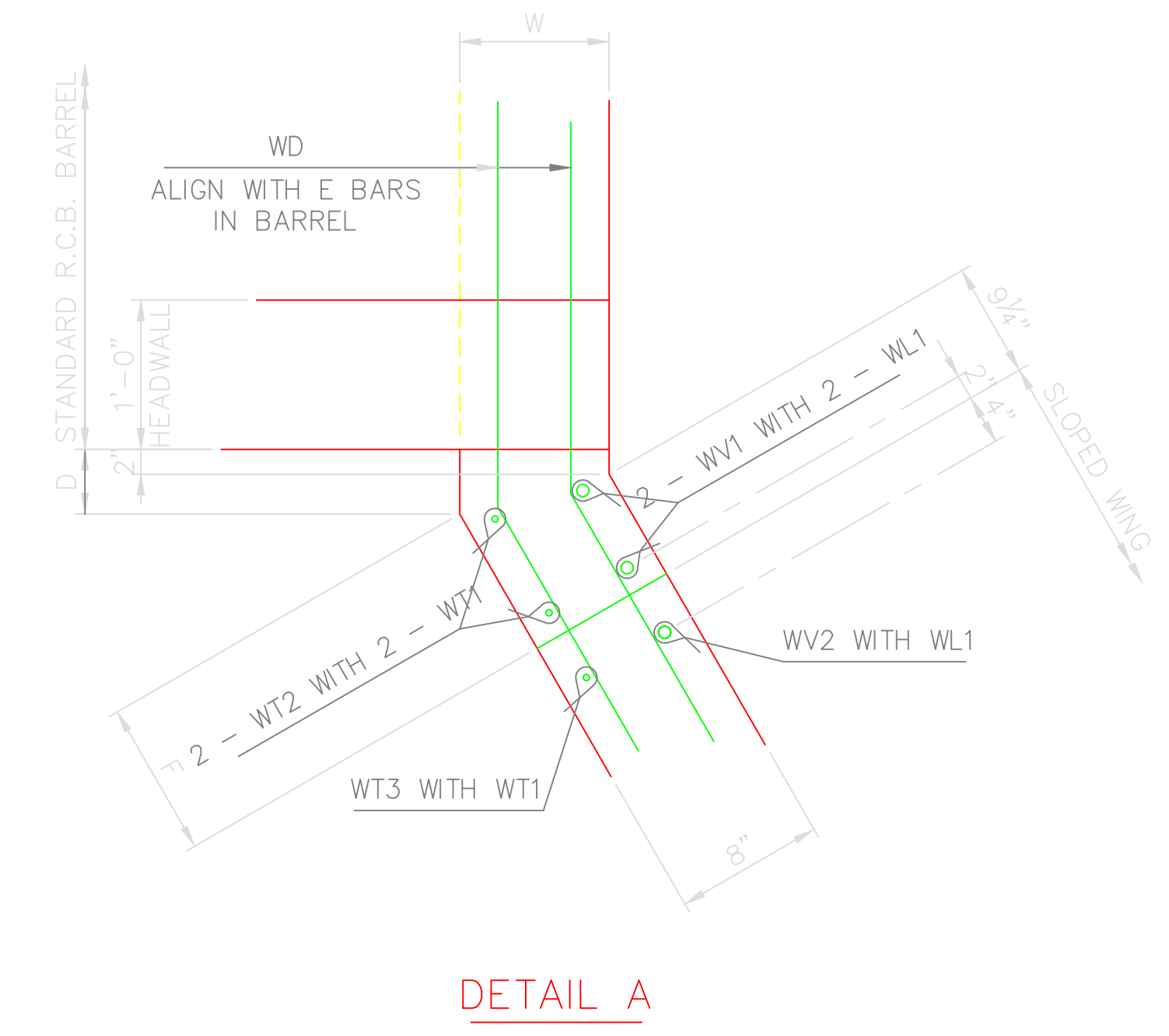
QUANTITIES									
ITEM	UNIT	4' SPAN	5' SPAN	6' SPAN	7' SPAN	8' SPAN	9' SPAN	10' SPAN	11' SPAN
CLASS AA CONCRETE	C.Y.	11.4	12.7	13.9	15.2	16.4	17.6	18.8	20.0
REINFORCING STEEL	LB.	1,980	2,140	2,300	2,440	2,560	2,730	2,870	3,020
PIPE RAILING	L.F.	42	45	48	51	54	57	60	63

APRON VARIABLES				
SPAN	DIMENSIONS		NO. OF BARS	
	R	Q	K	N
4'	15'-4"	14'-4 1/2"	20	18
5'	18'-4"	15'-10 1/2"	23	21
6'	21'-4"	17'-4 1/2"	26	24
7'	24'-4"	18'-10 1/2"	29	27
8'	27'-4"	20'-4 1/2"	32	30
9'	30'-4"	21'-10 1/2"	35	33
10'	33'-4"	23'-4 1/2"	38	36
11'	36'-4"	24'-10 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

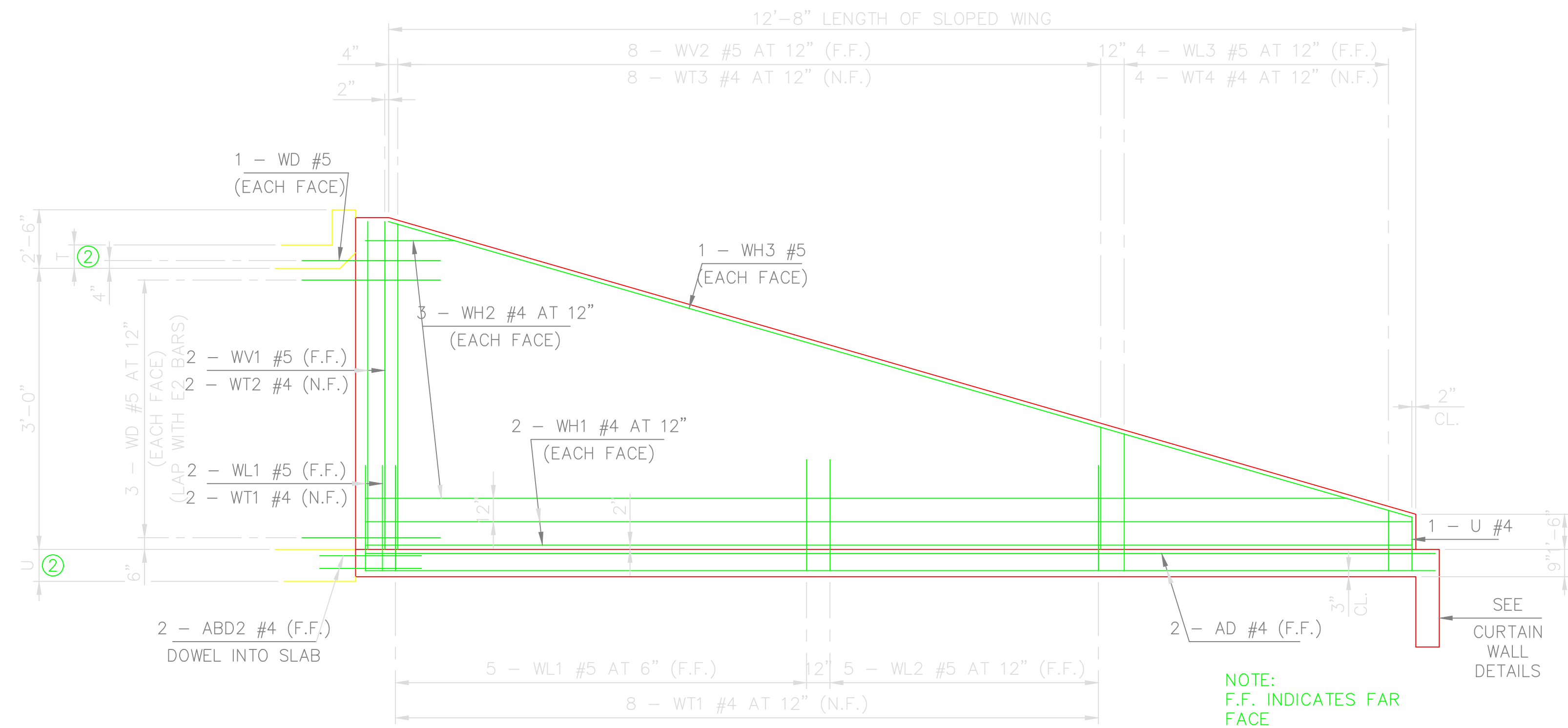
The City of
Oklahoma City
 Public Works Department
 Engineering Division

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

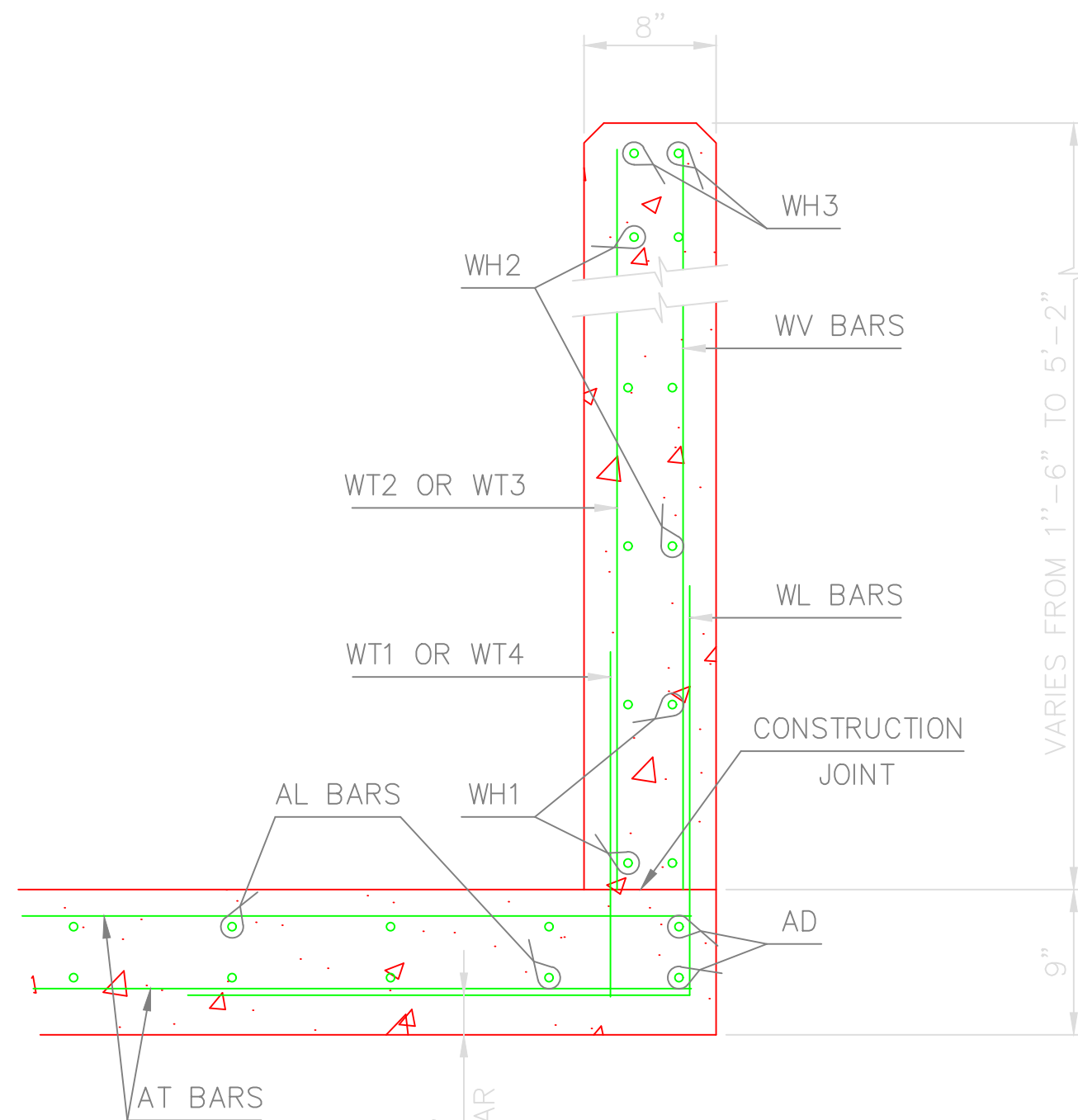
R.C.B. CULVERTS - END SECTION
 DETAILS
 TRIPLE CELL - 3' HEIGHT - 0° SKEW
 SHEET NO. 1 OF 2

Drawing Number
 RCB-064



WINGWALL ELEVATION

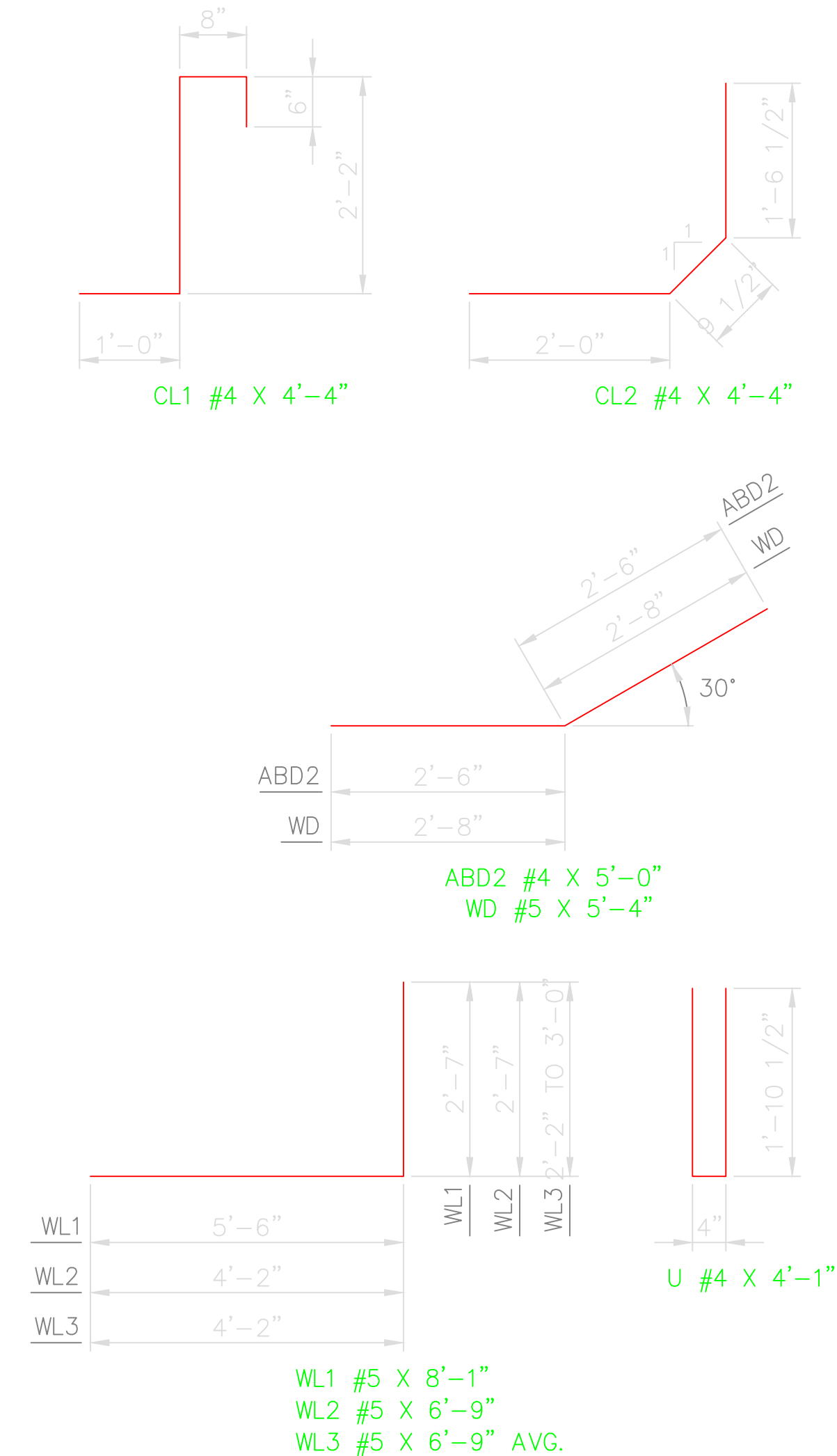
SEE STD. RCB-015 PipeRailing FOR DETAILS OF RAIL REQUIRED ON TOP OF HEADWALL AND WINGS



TYPICAL SECTION THRU WING

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

② FOR T AND U DIMENSIONS, SEE BARREL DETAILS



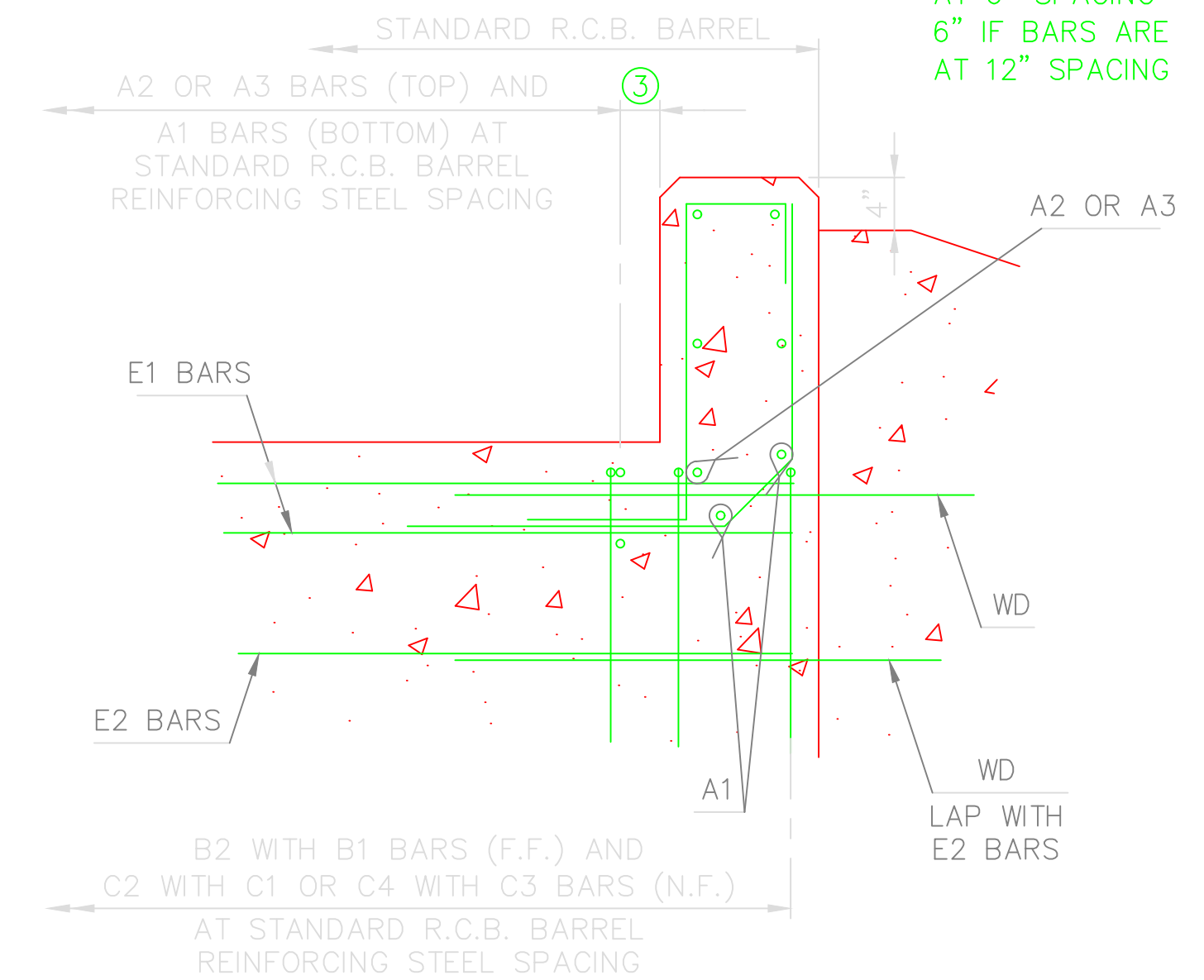
SPAN	BAR MARKS								
	A1	A2	A3	B1	B2	C1	C2	C3	C4
4'	+1	-1		+2	+2	+2	+2		
5'	+1	-1		+2	+2	+2	+2		
6'	+1			+2	+2	-4	-4	+2	+2
7'	+1					-4	-4	+2	+2
8'		-1				-4	-4	+2	+2
9'		-1				-4	-4	+2	+2
10'		-1				-4	-4	+2	+2
11'		-1				-4	-4	+2	+2

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.

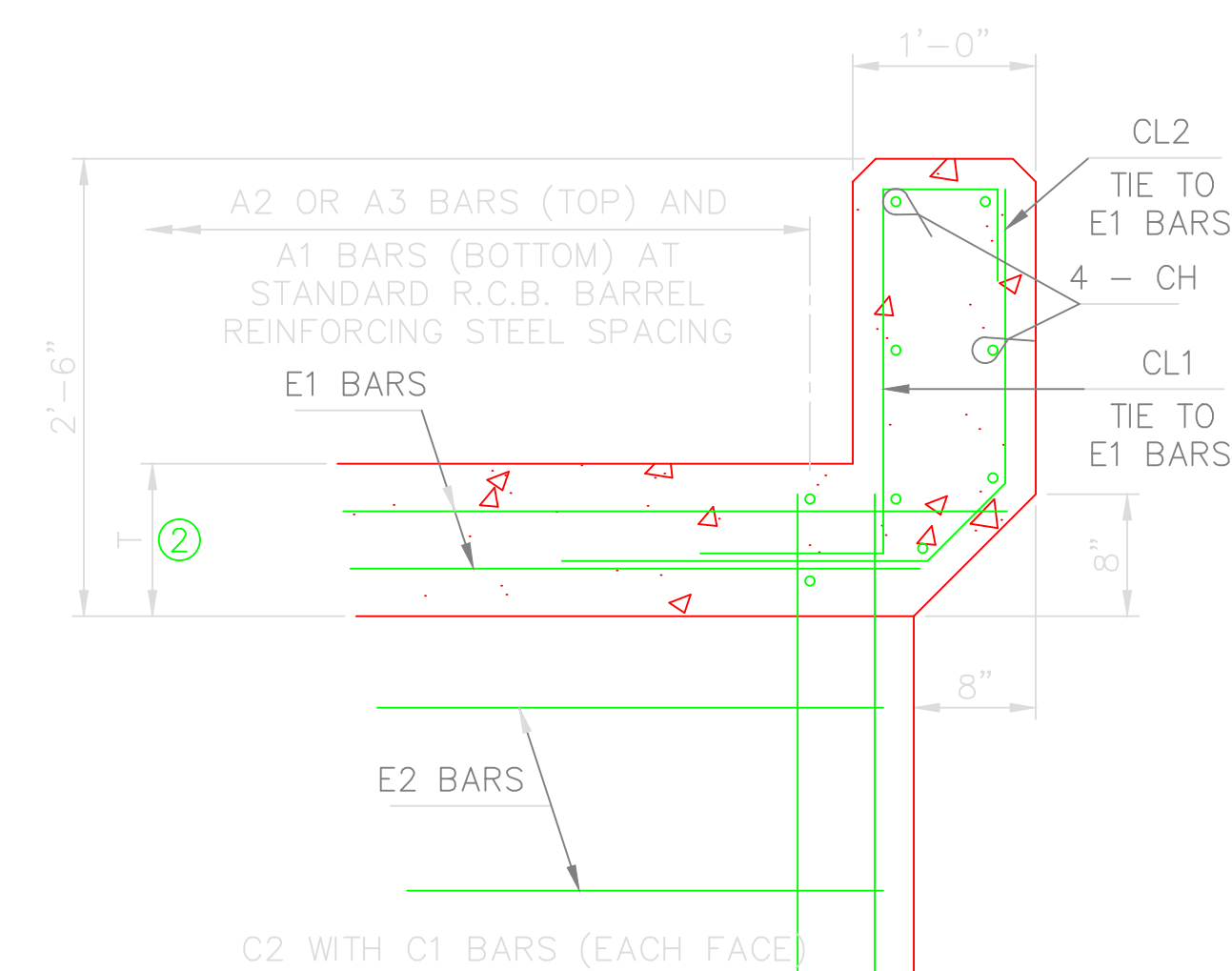
WINGWALL BAR LIST					
ONE WINGWALL SHOWN, TWO REQUIRED					
MARK	SIZE	NO.	FORM	LENGTH	LENGTH VARIATION
WD	#5	8	BNT.	5'-4"	
WH1	#4	4	STR.	13'-3"	
WH2	#4	6	STR.	7'-0" AVG.	3'-7" TO 10'-5"
WH3	#5	2	STR.	13'-0"	
WL1	#5	7	BNT.	8'-1"	
WL2	#5	5	BNT.	6'-9"	
WL3	#5	4	BNT.	6'-9" AVG.	6'-4" TO 7'-2"
WT1	#4	10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

① 2 SETS OF 3 BARS

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

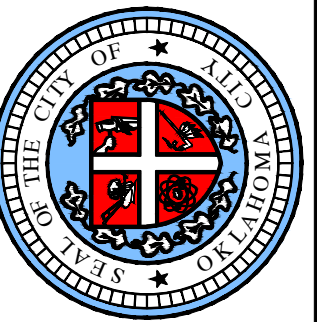


HEADWALL DETAIL AT EXTERIOR WALL



HEADWALL DETAIL AT INTERIOR WALL

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 CELL - 3' HEIGHT - 0° SKEW
SHEET NO. 2 OF 2

Drawing Number
RCB-065