

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

R.C.B. CULVERTS - END SECTION DETAILS
SINGLE CELL - 8' HEIGHT - 0° SKEW
SHEET NO. 1 OF 2

Drawing Number
RCB-026

APRON AND HEADWALL BAR LIST

| MARK | SIZE | FORM | 8' SPAN | | | 9' SPAN | | | 10' SPAN | | | 11' SPAN | | | 12' SPAN | | |
|------|------|------|---------|-------------|------------------|---------|-------------|------------------|----------|-------------|------------------|----------|-------------|------------------|----------|-------------|------------------|
| | | | NO. | LENGTH | LENGTH VARIATION | NO. | LENGTH | LENGTH VARIATION | NO. | LENGTH | LENGTH VARIATION | NO. | LENGTH | LENGTH VARIATION | NO. | LENGTH | LENGTH VARIATION |
| ABD1 | #4 | STR. | 20 | 4'-3" | | 22 | 4'-3" | | 24 | 4'-3" | | 26 | 4'-3" | | 28 | 4'-3" | |
| ABD2 | #4 | BNT. | 4 | 5'-0" | | 4 | 5'-0" | | 4 | 5'-0" | | 4 | 5'-0" | | 4 | 5'-0" | |
| AD | #4 | STR. | 4 | 30'-6" | | 4 | 30'-6" | | 4 | 30'-6" | | 4 | 30'-6" | | 4 | 30'-6" | |
| AL1 | #4 | STR. | 20 | 27'-7" | | 22 | 27'-7" | | 24 | 27'-7" | | 26 | 27'-7" | | 28 | 27'-7" | |
| AL2 | #4 | STR. | 60 | 14'-5" AVG. | 2'-4" TO 26'-6" | 60 | 14'-5" AVG. | 2'-4" TO 26'-6" | 60 | 14'-5" AVG. | 2'-4" TO 26'-6" | 60 | 14'-5" AVG. | 2'-4" TO 26'-6" | 60 | 14'-5" AVG. | 2'-4" TO 26'-6" |
| AT1 | #4 | STR. | 4 | 40'-0" | | 4 | 41'-2" | | 4 | 42'-2" | | 4 | 43'-2" | | 4 | 44'-2" | |
| AT2 | #4 | STR. | 27 | 24'-5" AVG. | 9'-4" TO 39'-6" | 27 | 25'-7" AVG. | 10'-6" TO 40'-8" | 27 | 26'-7" AVG. | 11'-6" TO 41'-8" | 27 | 27'-7" AVG. | 12'-6" TO 42'-8" | 27 | 28'-7" AVG. | 13'-6" TO 43'-8" |
| AT3 | #5 | STR. | 27 | 24'-5" AVG. | 9'-4" TO 39'-6" | 27 | 25'-7" AVG. | 10'-6" TO 40'-8" | 27 | 26'-7" AVG. | 11'-6" TO 41'-8" | 27 | 27'-7" AVG. | 12'-6" TO 42'-8" | 27 | 28'-7" AVG. | 13'-6" TO 43'-8" |
| CH | #4 | STR. | 4 | 9'-4" | | 4 | 10'-6" | | 4 | 11'-6" | | 4 | 12'-6" | | 4 | 13'-6" | |
| CL1 | #4 | BNT. | 10 | 4'-4" | | 13 | 4'-4" | | 14 | 4'-4" | | 15 | 4'-4" | | 16 | 4'-4" | |
| CL2 | #4 | BNT. | 10 | 4'-4" | | 13 | 4'-4" | | 14 | 4'-4" | | 15 | 4'-4" | | 16 | 4'-4" | |

① 4 SETS OF 15 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

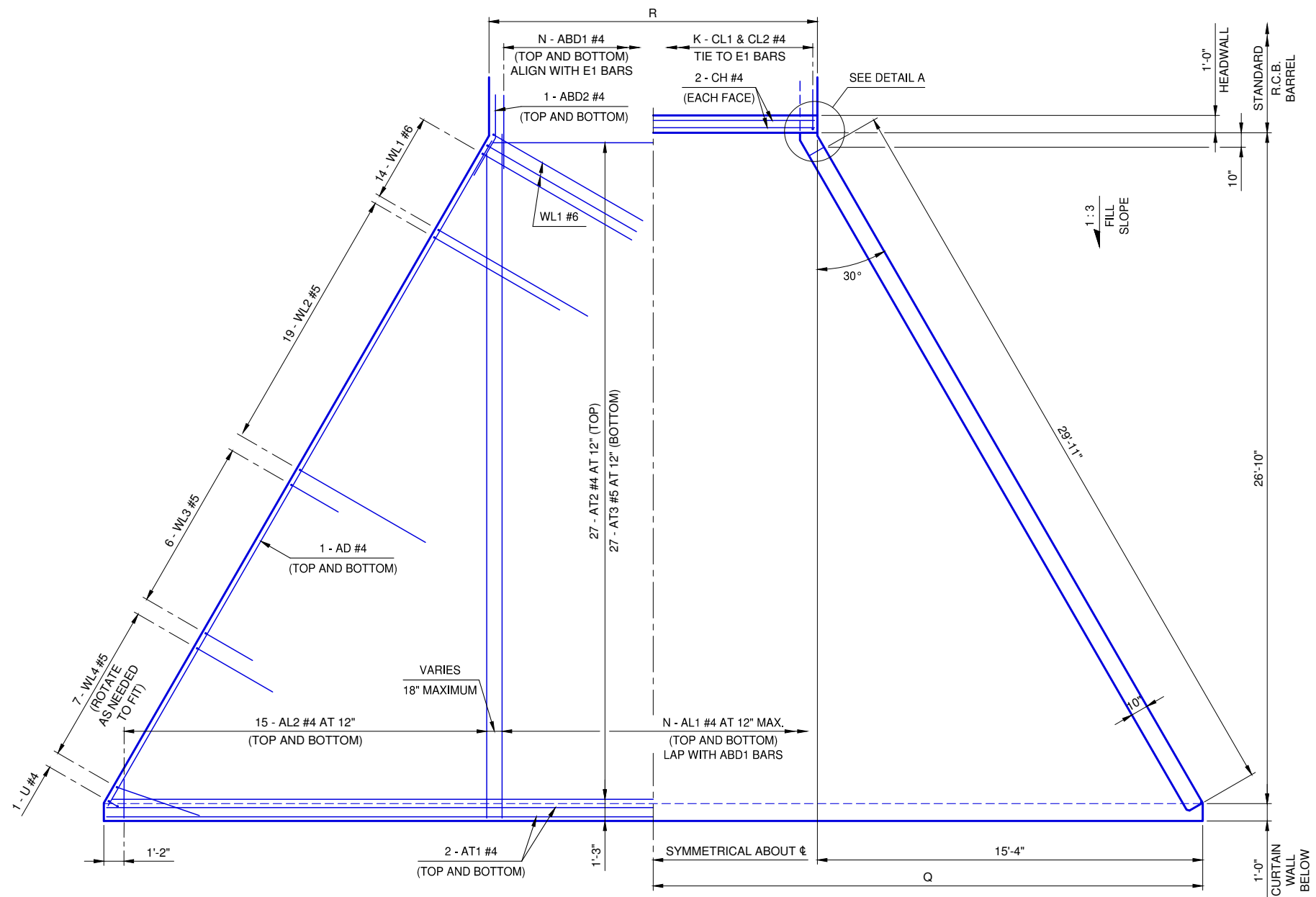
| ITEM | UNIT | 8' SPAN | 9' SPAN | 10' SPAN | 11' SPAN | 12' SPAN |
|-------------------|------|---------|---------|----------|----------|----------|
| CLASS AA CONCRETE | C.Y. | 38.4 | 39.7 | 40.8 | 41.9 | 42.9 |
| REINFORCING STEEL | LB. | 5,320 | 5,690 | 5,790 | 5,890 | 5,990 |
| PIPE RAILING | L.F. | 71 | 72 | 73 | 74 | 75 |

APRON VARIABLES

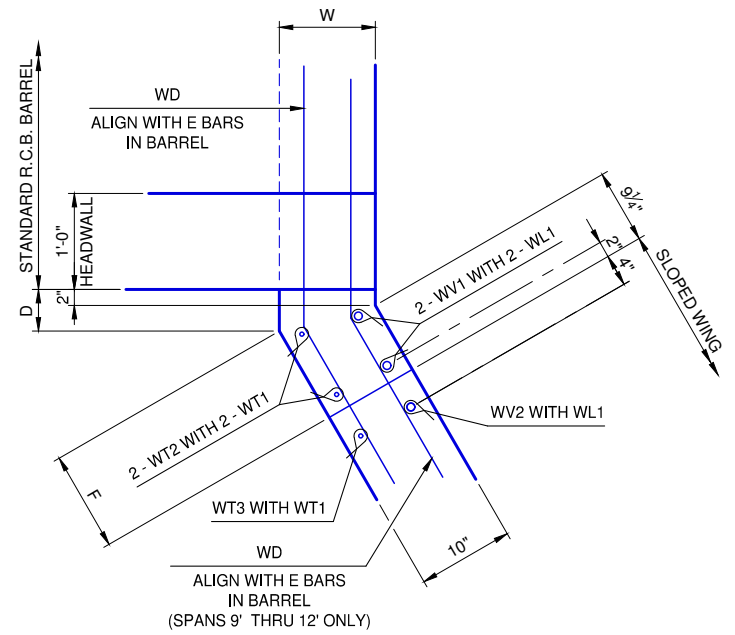
| SPAN | DIMENSIONS | | NO. OF BARS | |
|------|------------|--------|-------------|----|
| | R | Q | K | N |
| 8' | 9'-8" | 20'-2" | 10 | 10 |
| 9' | 10'-10" | 20'-9" | 13 | 11 |
| 10' | 11'-10" | 21'-3" | 14 | 12 |
| 11' | 12'-10" | 21'-9" | 15 | 13 |
| 12' | 13'-10" | 22'-3" | 16 | 14 |

WINGWALL DIMENSIONS

| SPAN | W | D | F |
|------|-----|----------|-------------|
| 8' | 10" | 4 11/16" | 11 15/16" |
| 9' | 11" | 2 15/16" | 1'-1 15/16" |
| 10' | 11" | 2 15/16" | 1'-1 15/16" |
| 11' | 11" | 2 15/16" | 1'-1 15/16" |
| 12' | 11" | 2 15/16" | 1'-1 15/16" |




APRON PLAN



DETAIL A

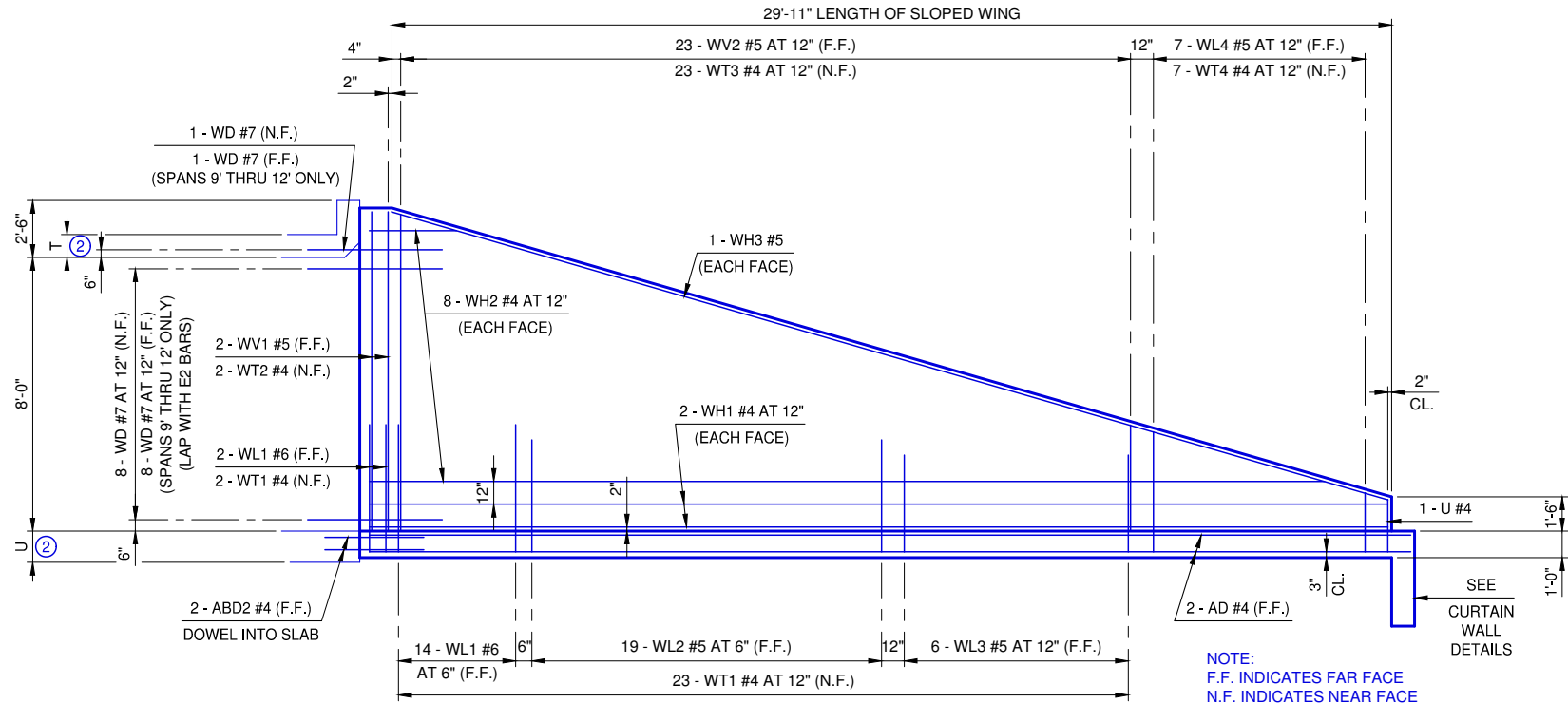
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R.C.B. CULVERTS - END SECTION DETAILS
SINGLE CELL - 8' HEIGHT - 0° SKEW
SHEET NO. 2 OF 2

Drawing Number
RCB-027

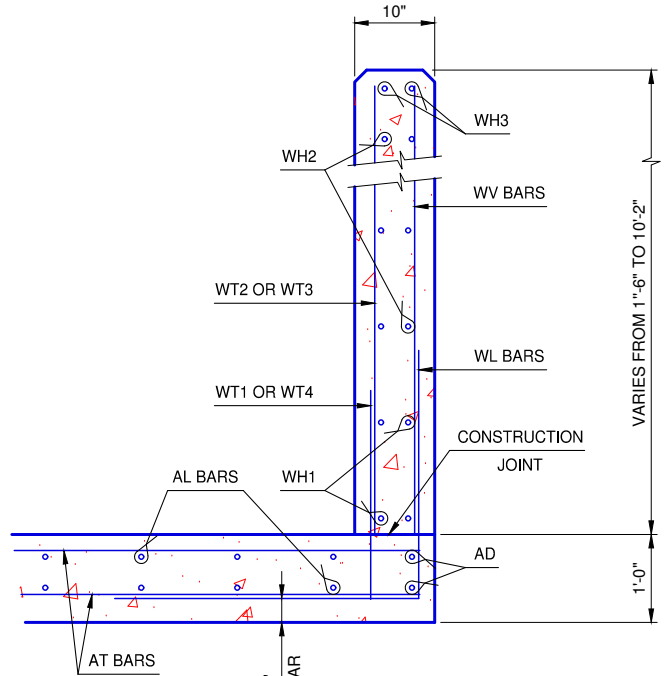
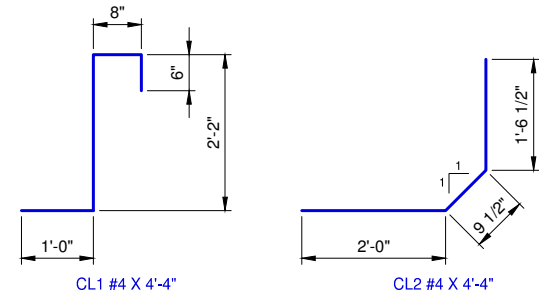


WINGWALL ELEVATION

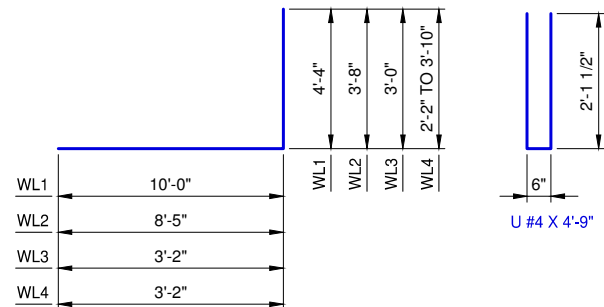
SEE STD. RCB-015 PipeRailing FOR DETAILS OF RAIL REQUIRED ON TOP OF HEADWALL AND WINGS

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

② FOR T AND U DIMENSIONS, SEE BARREL DETAILS



TYPICAL SECTION THRU WING



WL1 #6 X 14'-4"
WL2 #5 X 12'-1"
WL3 #5 X 6'-2"
WL4 #5 X 6'-2" AVG.

ADJUSTMENT IN NUMBER OF BARREL BARS IN END SECTION

| SPAN | BAR MARKS | | | | | |
|------|-----------|----|----|----|----|----|
| | A1 | A2 | B1 | B2 | C1 | C2 |
| 8' | | | | | +2 | +2 |
| 9' | | | | | +2 | +2 |
| 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.

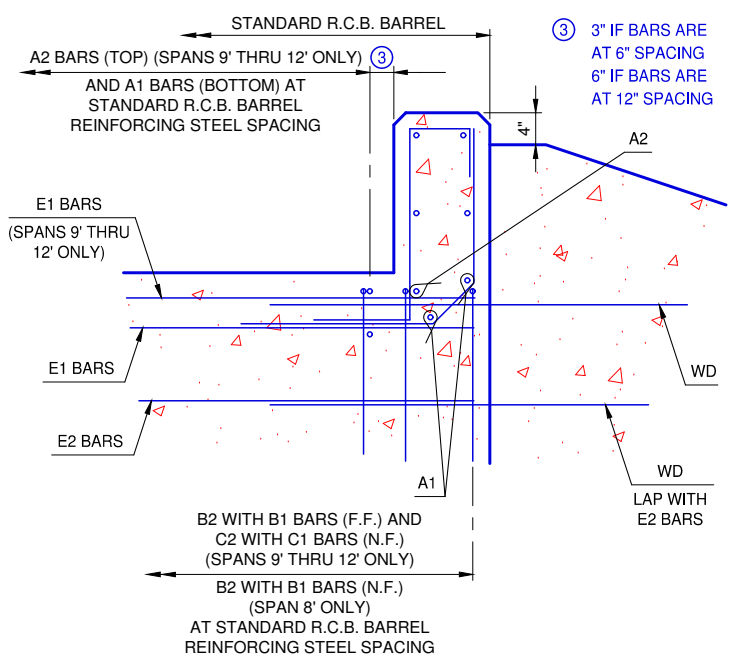
WINGWALL BAR LIST
ONE WINGWALL SHOWN, TWO REQUIRED

| MARK | SIZE | NO. | FORM | LENGTH | LENGTH VARIATION |
|------|------|-----|------|-------------|------------------|
| WD | #7 | 9 | BNT. | 6'-4" | |
| WH1 | #4 | 4 | STR. | 30'-6" | |
| WH2 | #4 | 16 | STR. | 15'-7" AVG. | 3'-6" TO 27'-8" |
| WH3 | #5 | 2 | STR. | 30'-11" | |
| WL1 | #6 | 16 | BNT. | 14'-4" | |
| WL2 | #5 | 19 | BNT. | 12'-1" | |
| WL3 | #5 | 6 | BNT. | 6'-2" | |
| WL4 | #5 | 7 | BNT. | 6'-2" AVG. | 5'-4" TO 7'-0" |
| WT1 | #4 | 25 | STR. | 2'-5" | |
| WT2 | #4 | 2 | STR. | 10'-0" | |
| WT3 | #4 | 23 | STR. | 6'-8" AVG. | 3'-6" TO 9'-10" |
| WT4 | #4 | 7 | STR. | 3'-0" AVG. | 2'-2" TO 3'-10" |
| WV1 | #5 | 2 | STR. | 10'-0" | |
| WV2 | #5 | 23 | STR. | 6'-8" AVG. | 3'-6" TO 9'-10" |
| U | #4 | 1 | BNT. | 4'-9" | |

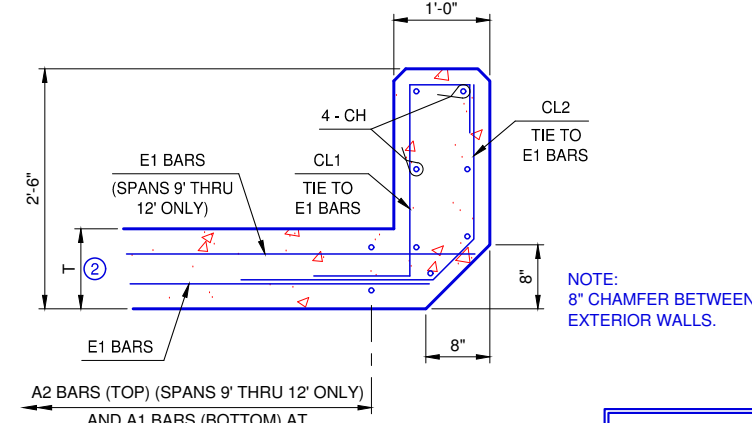
① 2 SETS OF 7 BARS

ADDITIONAL BARS REQUIRED IN 9', 10', 11' AND 12' SPANS
ONE WINGWALL SHOWN, TWO REQUIRED

| | | | | | |
|----|----|---|------|-------|--|
| WD | #7 | 9 | BNT. | 6'-4" | |
|----|----|---|------|-------|--|



HEADWALL DETAIL AT EXTERIOR WALL



HEADWALL DETAIL AT MIDSPAN

NOTE:
8" CHAMFER BETWEEN EXTERIOR WALLS.

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