REVISIONS	
DESCRIPTION	DATE

GUIDELINES FOR USING RCB CULVERT STANDARDS

1. DETERMINE REQUIRED WATERWAY OPENING BY HYDRAULIC ANALYSIS METHODS.

2. SELECT APPROPRIATE **RCB CULVERTS - BARREL DETAILS** SHEET BASED ON NUMBER OF CELLS, SPAN OF CELL(S), AND AMOUNT OF FILL COVER PROVIDED. THESE SHEETS PROVIDE THE DETAILS AND QUANTITIES PER LINEAR FOOT FOR THE BARREL.

   SINGLE CELL CULVERTS: STD. B-510 TO B-522
   DOUBLE CELL CULVERTS: STD. B-530 TO B-542
   TRIPLE CELL CULVERTS: STD. B-550 TO B-562

   STANDARD DESIGN NUMBERS DESCRIBE THE BARREL SECTIONS AS FOLLOWS:

   RCB-C3-10(2-12)

   RCB REFERS TO A REINFORCED CONCRETE BOX
   C3 REFERS TO THE NUMBER OF CELLS: TRIPLE CELL (CELLS = 3)
   10 REFERS TO THE SPAN LENGTH OF THE CELL: 10 FT. SPAN
   10′ SPAN SHEET PROVIDES DETAILS FOR 10′X3′, 10′X4′, 10′X5′, 10′X6′, 10′X7′, 10′X8′, 10′X9′, AND 10′X10′ BARREL SECTIONS.
   (2-12) REFERS TO THE FILL COVER RANGE ALLOWABLE: 2′ TO 12′ FILL

3. SELECT APPROPRIATE **RCB CULVERTS - END SECTION DETAILS** SHEETS BASED ON THE NUMBER OF CELLS, HEIGHT OF CELL(S), AND SKEW OF END SECTION RELATIVE TO BARREL SECTION. THESE SHEETS PROVIDE THE DETAILS AND QUANTITIES FOR THE APRON, HEADWALL, AND WINGWALLS.
   NOTE THAT DETAILS AND QUANTITIES GIVEN ARE FOR ONE END SECTION. THE RCB CULVERT CAN BE COMPRISED OF INLET AND OUTLET END SECTIONS WITH DIFFERING SKEWS, IF REQUIRED.

   THE TWO AVAILABLE SKEWS ARE 0° AND 30°.

   THE 0° SKEWED END SECTIONS CONSIST OF TWO SHEETS
   THE 30° SKEWED END SECTIONS CONSIST OF THREE SHEETS

   STANDARD DESIGN NUMBERS DESCRIBE THE END SECTIONS AS FOLLOWS:

   RCB-E3-H8-0-1

   RCB REFERS TO A REINFORCED CONCRETE BOX
   E3 REFERS TO AN END SECTION AND NUMBER OF CELLS: TRIPLE CELL (CELLS = 3)
   H8 REFERS TO THE HEIGHT OF THE CELL: 8 FT. HEIGHT
   8′ HEIGHT SHEET PROVIDES DETAILS FOR 8′X8′, 10′X8′, 12′X8′, 14′X8′, AND 16′X8′ END SECTIONS.
   0 REFERS TO THE SKEW OF THE END SECTION: 0° SKEW
   1 REFERS TO THE SHEET NO. IN THE SET: SHEET 1 OF 2

4. SELECT THE APPROPRIATE **RCB CULVERTS - CURTAIN WALL DETAILS** SHEET BASED ON THE NUMBER OF CELLS, CURTAIN WALL DEPTH, AND SKEW OF END SECTION RELATIVE TO BARREL SECTION.

   THE THREE AVAILABLE CURTAIN WALL DEPTHS ARE 4′, 6′, AND 8′.

   STANDARD DESIGN NUMBERS DESCRIBE THE END SECTIONS AS FOLLOWS:

   RCB-CW3-D6-0

   RCB REFERS TO A REINFORCED CONCRETE BOX
   CW3 REFERS TO A CURTAIN WALL SECTION AND NUMBER OF CELLS: TRIPLE CELL (CELLS = 3)
   D6 REFERS TO THE DEPTH OF THE CURTAIN WALL: 6 FT. DEPTH
   0 REFERS TO THE SKEW OF THE END SECTION: 0° SKEW

5. USE THE REFERENCE GUIDE SCHEDULES AS FOLLOWS:

   A. **BARREL DETAILS** ON STD. B-502
   KNOWING NUMBER OF CELLS, CHOOSE CELL SPAN AND FILL HEIGHT TO GET STANDARDS REQUIRED.
   - SINGLE
   - DOUBLE
   - TRIPLE

   B. **END SECTION DETAILS** ON STD. B-503
   KNOWING NUMBER OF CELLS, CHOOSE CELL HEIGHT, AND SKEW TO GET STANDARDS REQUIRED.
   - SINGLE
   - DOUBLE
   - TRIPLE

   C. **CURTAIN WALL DETAILS** ON STD. B-504
   KNOWING NUMBER OF CELLS, CHOOSE WALL DEPTH, AND SKEW TO GET STANDARD REQUIRED.
   - SINGLE
   - DOUBLE
   - TRIPLE

6. ADDITIONAL PLAN SHEETS WHICH MUST BE PROVIDED BY THE DESIGN ENGINEER MAY INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING:

   TITLE SHEET
   GENERAL NOTES
   PLAN AND PROFILE
   - DESIGN DATA
   - HYDRAULIC DATA
   - SUMMARY OF QUANTITIES TABLE
   - REQUIRED RCB STANDARDS LIST

   RIPRAP DETAILS

7. COPY DESIGN DATA TO PLAN AND PROFILE SHEET:

   DESIGN DATA:

   LOADING: HL-93 AND ODOT OVERLOAD TRUCK.

   DESIGN: BARREL SECTION - DESIGNED IN ACCORDANCE WITH 1998 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECOND EDITION, AND 1999, 2000, 2001, AND 2002 INTERIMS.

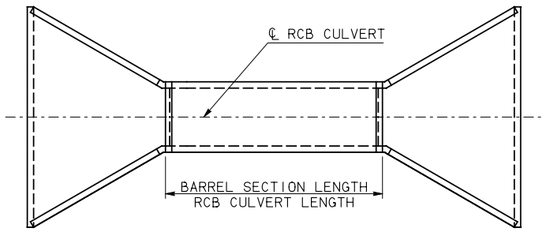
   END SECTIONS AND CURTAIN WALLS - DESIGNED IN ACCORDANCE WITH 2004 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, THIRD EDITION, AND 2005 AND 2006 INTERIMS.

   MATERIAL: CLASS AA CONCRETE: f′c = 4 KSI
   REINFORCING STEEL: FY = 60 KSI

8. QUANTITIES CALCULATION

   0° SKEW

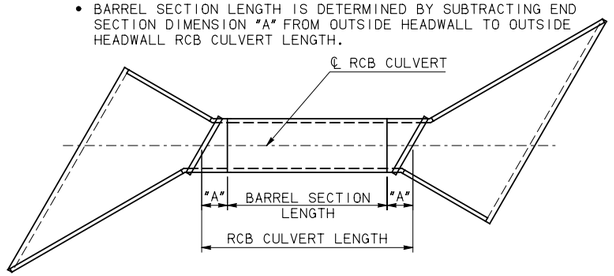
   - BARREL SECTION LENGTH IS FROM OUTSIDE HEADWALL TO OUTSIDE HEADWALL.



   - CONCRETE AND REINFORCING STEEL QUANTITIES FROM BARREL DETAIL SHEETS ARE MULTIPLIED BY THE BARREL SECTION LENGTH TO CALCULATE BARREL SECTION QUANTITIES.
   - CONCRETE AND REINFORCING STEEL QUANTITIES ARE GIVEN ON THE END SECTION DETAILS SHEETS FOR ONE END SECTION. THESE QUANTITIES INCLUDE REQUIRED ADJUSTMENTS FOR HEADWALL, 8″ CHAMFER, SHORTENED INTERIOR WALLS AT END OF BARREL, AND ADDITIONAL BARREL REINFORCING STEEL.
   - CONCRETE AND REINFORCING STEEL QUANTITIES ARE GIVEN ON THE CURTAIN WALL DETAIL SHEETS FOR ONE CURTAIN WALL.
   - BARREL SECTION QUANTITIES ARE COMBINED WITH ONE OR TWO END SECTION AND CURTAIN WALL QUANTITIES TO DETERMINE TOTAL QUANTITES FOR ONE RCB CULVERT.

   30° SKEW

   - BARREL SECTION LENGTH IS DETERMINED BY SUBTRACTING END SECTION DIMENSION "A" FROM OUTSIDE HEADWALL TO OUTSIDE HEADWALL RCB CULVERT LENGTH.



   - CONCRETE AND REINFORCING STEEL QUANTITIES ARE DETERMINED FOR THE BARREL SECTION, END SECTION, AND CURTAIN WALLS IN THE SAME MANNER AS DESCRIBED IN 0° SKEW METHOD.
   - BARREL SECTION QUANTITIES ARE COMBINED WITH ONE OR TWO END SECTION AND CURTAIN WALL QUANTITIES TO DETERMINE TOTAL QUANTITES FOR ONE RCB CULVERT.

APPROVED BY BRIDGE ENGINEER Robert J. Rusch DATE 4/09/09

OKLAHOMA DEPT. OF TRANSPORTATION
BRIDGE STANDARD (ENGLISH)

REFERENCE GUIDE TO
RCB CULVERT STANDARDS
(SHEET 1 OF 3)

1999 SPECIFICATIONS	RCB-GUIDE-1	00E B-501E