

DISCLAIMER:  
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| Culvert Station and/or Creek Name followed by applicable end (Lt, Rt or Both) | Description of Box Culvert<br><br>No. Spans ~<br>Span X Height | Max Fill Height<br><br>(Ft) | Applicable Box Culvert Standard<br><br>④ | Applicable Wingwall or End Treatment Standard | Skew Angle<br><br>(0°, 15°, 30° or 45°) | Side Slope or Channel Slope Ratio<br><br>(SL:1) | T Culvert Top Slab Thickness<br><br>(In) | U Culvert Wall Thickness<br><br>(In) | C Estimated Curb Height<br><br>(Ft) | Hw ① Height of Wingwall<br><br>(Ft) | A Curb to End of Wingwall<br><br>(Ft) | B Offset of End of Wingwall<br><br>(Ft) | Lw Length of Longest Wingwall<br><br>(Ft) | Ltw Culvert Toewall Length<br><br>(Ft) | Atw Anchor Toewall Length<br><br>(Ft) | Riprap Apron<br><br>(CY) | Class "C" Conc (Curb)<br><br>(CY) ② | Class "C" Conc (Wingwall)<br><br>(CY) ③ | Total Wingwall Area<br><br>(SF) |
|---|--|-----------------------------|--|---|---|---|--|--------------------------------------|-------------------------------------|-------------------------------------|---------------------------------------|---|---|--|---------------------------------------|--------------------------|-------------------------------------|---|---------------------------------|
|   |  |                             |  |   |   |   |  |                                      |                                     |                                     |                                       |   |   |  |                                       |                          |                                     |   |                                 |
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|   |  |                             |  |   |   |   |  |                                      |                                     |                                     |                                       |   |   |  |                                       |                          |                                     |   |                                 |

NOTES:  
Skew = 0° on SW-0, FW-0, SETB-CD, SETB-SW-0, and SETB-FW-0 standard sheets;  
30° maximum for safety end treatment

SL:1 = Horizontal : 1 Vertical

- Side slope at culvert for flared or straight wingwalls.
- Channel slope for parallel wingwalls.
- Slope must be 3:1 or flatter for safety end treatments.

T = Box culvert top slab thickness. Dimension can be found on the applicable box culvert standard sheet.

U = Box culvert wall thickness. Dimension can be found on the applicable box culvert standard sheet.

C = Curb height

See applicable wing or end treatment standard sheets for calculations of Hw, A, B, Lw, Ltw, Atw, and Total Wingwall Area.

Hw = Height of wingwall

A = Distance from face of curb to end of wingwall (not applicable to parallel or straight wingwalls)

B = Offset of end of wingwall (not applicable to parallel or straight wingwalls)

Lw = Length of longest wingwall.

Ltw = Length of culvert toewall (not applicable when using riprap apron)

Atw = Length of anchor toewall (applicable to safety end treatment only)


Total Wingwall Area = Wingwall area in sq. ft. for two wingwalls (one structure end) if Lt or Rt.  
Area for four wingwalls (two structure ends) if Both.

- ① Round the wall heights shown to the nearest foot for bidding purposes.
- ② Concrete volume shown is for box culvert curb only. For curbs using the Box Culvert Rail Mounting Details (RAC) standard sheet quantities shown must be increased by a factor of 2.25. If Class S concrete is required for the top slab of the culvert, also provide Class S concrete for the curb. Curb concrete is considered part of the Box Culvert for payment.
- ③ Concrete volume shown is total of wings, footings, culvert toewall (if any), anchor toewalls (if any) and wingwall toewalls. Riprap aprons, culverts, and curb quantities are not included.
- ④ Regardless of the type of culvert shown on this sheet, the Contractor has the option of furnishing cast-in-place or precast culverts unless otherwise shown elsewhere on the plans. If the Contractor elects to provide culverts of a different type than those shown on this sheet, it is the Contractor's responsibility to make the necessary adjustments to the dimensions and quantities shown.

**SPECIAL NOTE:**

This sheet is a supplement to the box culvert standards. It is to be filled out by the culvert specifier and provides dimensions for the construction of the box culvert wingwalls and safety end treatments.

An Excel 2010 spreadsheet to assist in completing this table can be downloaded from the Bridge Standards (English) web page on the TxDOT web site. The completed sheet must be signed, sealed, and dated by a licensed Professional Engineer.

  
**Texas Department of Transportation**

**Bridge Division Standard**

BOX CULVERT SUPPLEMENT  
WINGS AND END TREATMENTS

BCS

|                       |           |           |           |           |
|-----------------------|-----------|-----------|-----------|-----------|
| FILE: bcsstdel-20.dgn | DN: TxDOT | CK: TxDOT | OW: TxDOT | CK: TxDOT |
| ©TxDOT February 2020  | CONT      | SECT      | JOB       | HIGHWAY   |
| REVISIONS             |           |           |           |           |
| DIST                  |           | COUNTY    |           | SHEET NO. |

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