DATE:
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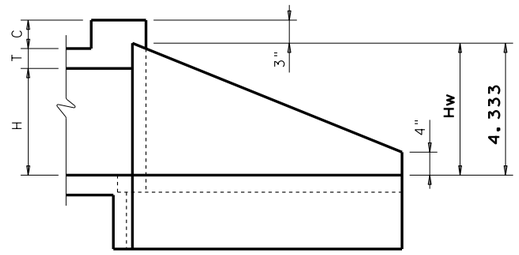
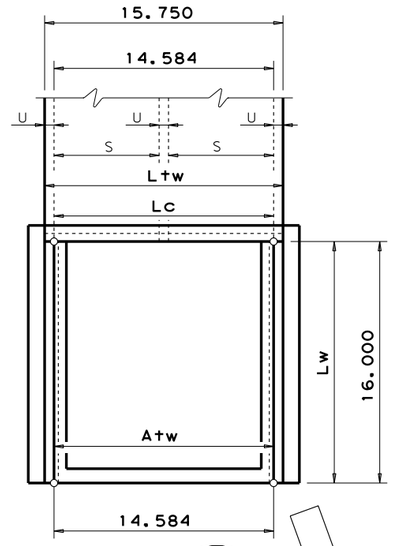


WINGWALL ELEVATION



STRAIGHT END PLAN

CONCRETE DIMENSIONS:

Hw = H + T + C - 0.250
= (3.000) + (0.583) + (1.000) - (0.250)
= **4.333**
Lw = (Hw - 0.333) (SL)
= (4.333 - 0.333) (4)
= **16.000**
Ltw = (N) (S) + (N+1) (U)
= (2) (7.000) + (2+1) (0.583)
= **15.750**
Lc = (Ltw) - (2U)
= (15.750) - (2) (0.583)
= **14.584**
Atw = Lc
= **14.584**
Total Wing Area = (Lw) (Hw + 0.333)
= (16.000) (4.333 + 0.333)
= **74.656** (S.F. ~ 2 Wings)

PIPE LOCATIONS & DIMENSIONS:

Establish Pipe Runner Spacing
(14.584) ÷ (2.500 max)
= 5.8 ~ 6 spaces
(14.584) ÷ (6)
= 2.431
Use:
L2 = runner spacing at Curb and at Anchor Toewall
= **6 spa at 2.431 = 14.584**
Establish Pipe Runner Length and Size:
Pc = (Lw) (K1) - (1.688 end of pipe clearance)
= (16.000) (1.031) - (1.688)
= **14.808**
Test: (Pc) > (9.333 max length 3" Pipe Runner)
= (14.808) > (9.333)
= yes, do not use 3" Pipe Runner
Test: (Pc) > (19.000 max length 4" Pipe)
= (14.808) > (19.000)
= no, **use 4" Pipe Runner & 3" anchor Pipe**

BOX CULVERT PARAMETERS:

2 ~ 7′ x 3′ Multi-Box Culvert with 8′ Fill, 4:1 Slope, and 1.000′ Curb (C). From MC-7-10 Std: H = 3.000′, T = 0.583′, and U = 0.583′.

DEFINITIONS:

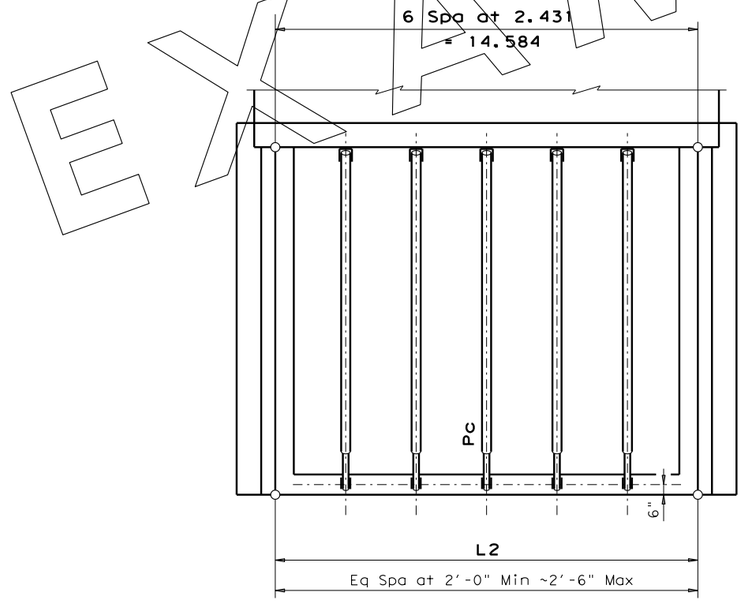
Hw = Wingwall height (at tallest point)
H = Interior height of Culvert box
T = Culvert Slab thickness
C = Height of Curb above Top of top Slab
Lw= Length of Wingwall
SL:1 = Side Slope Ratio (Horizontal : 1 Vertical)

SL:1	Slope Angle
3:1	= 18.4349°
4:1	= 14.0362°
5:1	= 9.4623°

K = Constant values for use in formulas

SL:1	K1
3:1	~ 1.054
4:1	~ 1.031
6:1	~ 1.014

Note: K1 = (1 ÷ Cosine Slope Angle)
Atw = Anchor Toewall length (along outside face of toewall)
N = Number of Culvert Spans
S = Interior width of Culvert Span
U = Thickness of Culvert Wall
Ltw = Length of Culvert Curb
Lc = Length of Culvert Curb between wings
Pc = Length of Pipe Runner on Curb



PIPE RUNNER PLAN

NOT A STANDARD

NOT FOR INCLUSION IN THE PLANS

Texas Department of Transportation

Bridge Division Standard

EXAMPLE CALCULATIONS FOR SETB-SW-O STANDARD

FILE: exstde02.dgn	DN: GAF	CK: CAT	DW: JRP	CK: GAF
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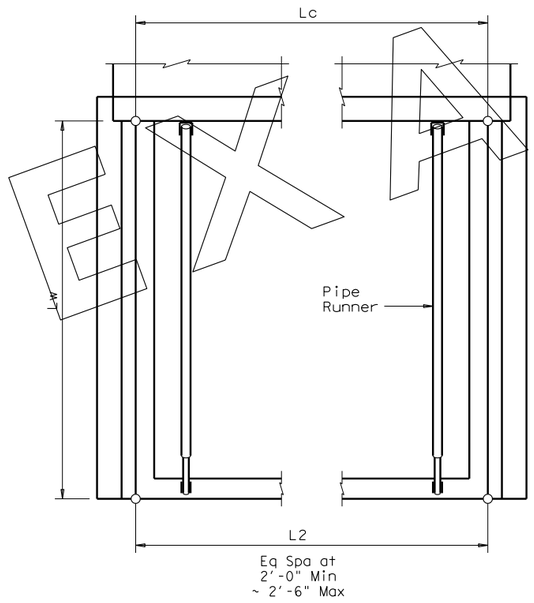
REVISIONS				
	DIST	COUNTY		SHEET NO.

DATE:
FILE:

Culvert Station and/or Creek name followed by applicable end (Lt, Rt or Both) (11)	Lc (Ft)	L2			Pipe Runner (Pc)				3'-0" Anchor Pipe	
		No. Spa	Spa at (Ft)	Overall Length (Ft)	No.	Length (Ft)	Size (3",4" or 5")	Total Length (Ft) (11)	Size (2",3" or 4")	Total Length (Ft) (11)
Velma Gulch (Both)	14.583'	6	2.431'	14.583'	5	14.813'	4"	148.125'	3"	30.000'

(11) Quantities shown are for one structure end if Lt or Rt. Quantities shown are for two structure ends if Both.



PIPE RUNNER LAYOUT

SPECIAL NOTE:

This tabular sheet is to be filled out by the culvert specifier and provides information for the construction details and quantities of Pipe Runners.

An Excel 97 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 shall be signed, sealed, and dated by a licensed Professional Engineer.

Note that the tabular quantities are given for estimating purposes only. It is likely that these quantities will change due to field conditions. Therefore, all dimensions shall be verified by the Contractor in the field prior to fabrication of the Safety End Treatment components.

NOT A STANDARD

NOT FOR INCLUSION IN THE PLANS

Texas Department of Transportation

Bridge Division Standard

EXAMPLE OF COMPLETED SHEET 3 OF 3 SETB-SW-O STANDARD

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