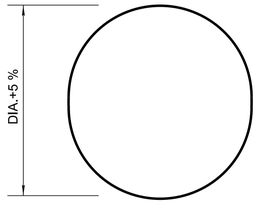
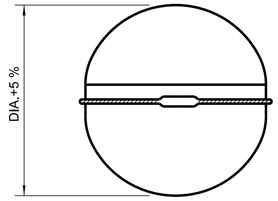
ALTERNATE METHODS OF STRUTTING FOR CORRUGATED METAL PIPE, CORRUGATED ALUMINUM PIPE & STRUCTURAL PLATE PIPE

NOTE: DO NOT STRUT PIPE-ARCHES



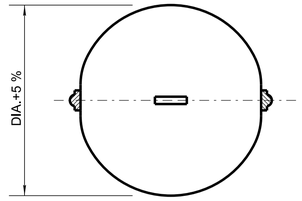
FACTORY FORMED VERTICALLY ELONGATED SHAPE FOR CORRUGATED METAL AND STRUCTURAL PLATE PIPE ONLY

NOTE: FACTORY FORMED 5 % VERTICALLY ELONGATED PIPE CAN BE INSTALLED WITHOUT STRUTTING, UP THROUGH 108 INCH DIAMETER TO 30 FEET OF COVER AND OVER 108 INCH DIAMETER TO 20 FEET OF COVER.



WIRE STRUTS FOR CORRUGATED METAL PIPE ONLY

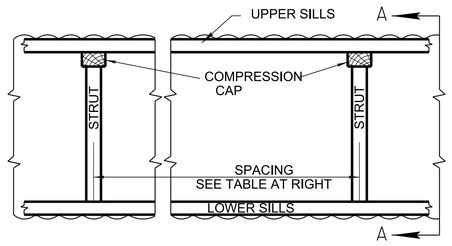
NOTE: WIRES SHALL BE PLACED AT 2' INTARVALS ON THE HORIZONTAL DIAMETERS OF PIPE TO BE WIRE-STRUTTED. AT LEAST FOUR NO. 9 WIRES SHALL BE USED AT EACH POINT. THE WIRES SHALL BE TWISTED TO HOLD THE PIPE TO THE REQUIRED DEFORMED SHAPE AND SHALL BE OF SUFFICIENT LENGTH SO THAT WHEN UNTWISTED THEY WILL PERMIT THE PIPE TO ASSUME ITS NORMAL SHAPE WITHOUT BREAKING THE WIRES.



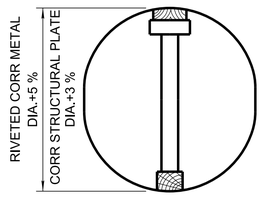
ROD & TURNBUCKLE STRUTS FOR CORRUGATED METAL PIPE ONLY

NOTE: RODS SHALL BE PLACED AT 2 FOOT INTERVALS ON THE HORIZONTAL DIAMETERS OF PIPE TO BE ROD-STRUTTED. THE DIAMETER OF EACH ROD SHALL NOT BE LESS THAN ½". EACH ROD, OR ROD ASSEMBLY IF TURNBUCKLES ARE USED, SHALL BE THREADED ON EACH END AND SHALL BE OF SUFFICIENT LENGTH TO ACCOMMODATE A NUT AND WASHER AND A 3"x4"x18" WOOD BLOCK OR A 2"x2"x18" (MIN.) ANGLE ON EACH END, IN ADDITION TO SPANNING THE DIAMETER OF THE PIPE. THE WOOD BLOCKS OR ANGLES SHALL BE PLACED ON THE OUTSIDE OF THE PIPE AND BETWEEN THE PIPE AND WASHERS.

WITH ROD AND TURNBUCKLE STRUTS, A SCHEDULE SHALL BE SET TO BACK OFF THE TURNBUCKLES AS THE FILL IS PLACED, ALL TURNBUCKLES IN EACH LINE OF PIPE SHALL BE RELEASED UNIFORMLY, A TURN OR TWO AT A TIME. ALLOW SOME TENSION TO REMAIN IN THE RODS UNTIL THE FILL HAS BEEN COMPLETED.



LONGITUDINAL SECTION



END VIEW A-A

SPECIAL NOTES

CORRUGATED METAL STRUCTURAL PLATE PIPE	CORRUGATED ALUMINUM PIPE
FACTORY FORMED 5 % VERTICALLY ELONGATED STRUCTURAL PLATE PIPE HELD IN ELONGATED SHAPE BY TIMBER STRUTS WEDGED IN PLACE UNTIL FILL IS COMPLETED, MAY BE USED IN LIEU OF OTHER METHODS SHOWN ON THIS DRAWING, FOR PIPES HAVING A DIAMETER OF 60" OR LARGER, SPACING AND SIZE OF TIMBER STRUTS SHALL BE IN ACCORDANCE WITH TIMBER STRUT TABLE ON THIS DRAWING.	FACTORY FORMED 5 % VERTICALLY ELONGATED PIPE, HELD IN ELONGATED SHAPE BY TIMBER STRUTS WEDGED IN PLACE UNTIL FILL IS COMPLETED, WILL BE REQUIRED FOR ALL PIPE HAVING A DIAMETER OF 48" OR LARGER, SPACING AND SIZE OF TIMBER STRUTS SHALL BE IN ACCORDANCE WITH TIMBER STRUT TABLE ON THIS SHEET.

NOT TO SCALE

TIMBER STRUTS FOR CORRUGATED METAL & STRUCTURAL PLATE PIPE AND CORRUGATED ALUMINUM PIPE

(TIMBER STRUTS WILL NOT BE USED WHEN PIPE HAS A PAVED INVERT)

SPACING IN METERS OF TIMBER STRUTS FOR CORR. METAL AND CORR. STRUCTURAL PLATE PIPE

PIPE DIA (IN)	STRUT SIZE (IN)	HEIGHT OF COVER IN FEET										
		5	10	15	20	30	40	50	60	70	80	100
48	4x4	6.0	6.0	6.0	6.0	5.0	3.5					
	4x6					6.0	5.0	4.0	3.5	3.0		
	6x6							6.0	5.0	4.5	4.0	3.5
	6x8										6.0	5.0
60	4x4	6.0	6.0	6.0	6.0	4.0	3.0					
	4x6					6.0	4.5	3.5	3.0			
	6x6							5.5	4.5	4.0	3.5	3.0
	6x8									5.5	4.5	4.0
72	4x4	6.0	6.0	6.0	5.0	3.0						
	4x6				6.0	5.0	3.5	3.0				
	6x6						6.0	4.5	4.0	3.5	3.0	3.0
	6x8								5.0	4.5	4.0	3.5
84	4x4	6.0	6.0	5.0	4.0							
	4x6				5.5	4.0	3.0	4.0				
	6x6					6.0	5.0	5.0	3.5	3.0		
	6x8								4.5	4.0	3.5	3.0
	8x8										4.5	3.5
96	4x4	6.0	5.5	4.0	3.0							
	4x6			6.0	4.5	3.0						
	6x6					5.5	4.5	3.5	3.0			
	6x8						5.5	4.5	4.0	3.5	3.0	
	8x8									4.5	4.0	3.0
108	4x4	6.0	4.0	3.0								
	4x6		6.0	4.5	3.0							
	6x6				6.0	5.0	3.5	3.0				
	6x8					6.0	5.0	4.0	3.5	3.0		
	8x8								4.5	4.0	3.5	
120	4x6	6.0	4.0	3.0								
	6x6		6.0	6.0	6.0	4.0	3.0					
	6x8				6.0	5.5	4.0	3.5	3.0			
	8x8							5.0	4.0	3.5	3.0	
132	4x6	6.0	3.0									
	6x6		6.0	6.0	5.0	3.5						
	6x8			6.0	6.0	4.5	3.5	3.0				
	8x8						5.5	4.5	4.0	3.5	3.0	
144	4x6	4.5										
	6x6		6.0	6.0	4.5	3.0						
	6x8		6.0	6.0	5.5	4.0	3.0					
	8x8						5.0	4.0	3.5	3.0		
156	6x6	6.0	6.0	5.0	3.5							
	6x8		6.0	6.0	4.5	3.0						
	8X8					6.0	4.5	3.5	3.0			
168	6x6	6.0	5.0	3.5								
	6x8	6.0	6.0	5.0	3.5							
	8X8				6.0	5.0	4.0	3.0				
180	6x6	6.0	4.0	3.0								
	6x8	6.0	5.5	4.0	3.0							
	8X8				6.0	4.5	3.5					

NOTE: TRANSVERSE CAPS AND SILLS SHOULD BE OF SAME SIZE TIMBER AS STRUTS AND PLACED WITH LEAST DIMENSION VERTICAL. LENGTH OF STRUTS SHOULD BE DIAMETER OF PIPE TIMES 1.03 MINUS (3) THREE TIMES THE LEAST DIMENSION OF STRUT. STRUT SPACING COMPUTED FOR FULL DIMENSION (NOT NOMINAL). SOUND STRUCTURAL TIMBER BASED ON AASHTO TIMBER COLUMN FORMULA P/A = C [1/3 (L/RD)], USING C = 3900, E = 16X10 , SF = 1 FOR TEMPORARY CONSTRUCTION. FOR PIPE DIAMETERS NOT SHOWN ABOVE, INTERPOLATE OR USE NEXT LARGER DIMENSION.

TIMBER STRUTS SHALL BE LEFT IN PLACE UNTIL FILL IS CONSOLIDATED OR SHALL BE REMOVED AT THE DIRECTION OF THE ENGINEER.

GENERAL NOTES

(A) THE NOMINAL HORIZONTAL DIAMETER OF C.M. OR CORR. ALUM. PIPE SHALL BE REDUCED APPROXIMATELY 5 PERCENT BY STRUTTING. A TOLERANCE OF 20 PERCENT IN THE 5 PERCENT DIAMETER REDUCTION WILL BE PERMITTED. IF THE METHOD OF STRUTTING AS USED HAS CAUSED ANY DAMAGE TO THE PIPE, THE CONTRACTOR SHALL, AT HIS EXPENSE, REPLACE SUCH PIPE OR REPAIR IT TO THE THE SATISFACTION OF THE ENGINEER. PAVED INVERT PIPE SHALL NOT BE STRUTTED WITH TIMBERS.

(B) FACTORY FORMED 5 % VERTICALLY ELONGATED C.M. OR CORR. ALUMINUM PIPE, HELD IN ELONGATED SHAPE BY HIGH TENSILE STRENGTH WIRES UNTIL FILL IS COMPLETED, MAY BE USED IN LIEU OF OTHER METHODS SHOWN ON THIS DRAWING FOR STRUTTED RIVETED PIPE.

(C) STRUTS SHALL BE LEFT IN PLACE UNTIL THE FILL IS COMPACTED AFTER WHICH THE STRUTS SHALL BE REMOVED AS DIRECTED.

(D) HOLES FOR ROD OR WIRE STRUTS SHALL NOT BE LARGER THAN NECESSARY.

(E) SEE DWG. D-PG-3 & D-PG-4 FOR PIPE DETAILS

REV. 7-1-72: CHANGED DEPARTMENT NAME.

REV. 1-1-76: CHANGED DWG. NO.FROM CM-1-7(68) TO D-PS-1.

REV. 3-15-76: DELETED REFERENCE TO OLD DWG. NO., SUBSTITUTED NEW DWG. NO.

◘ REV. 06-28-19: REDREW SHEET.

◘ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

STRUTTING DETAILS FOR CORR. METAL & STRUCTURAL PLATE ROUND PIPE

D-PS-1