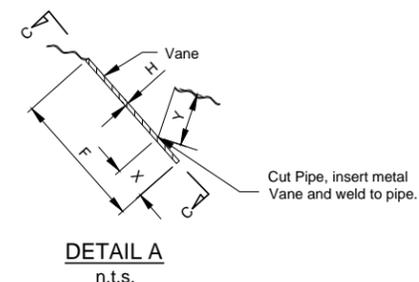
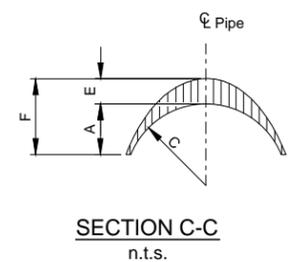
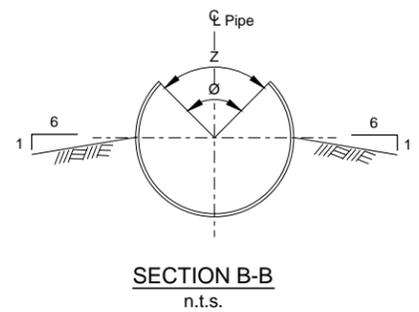
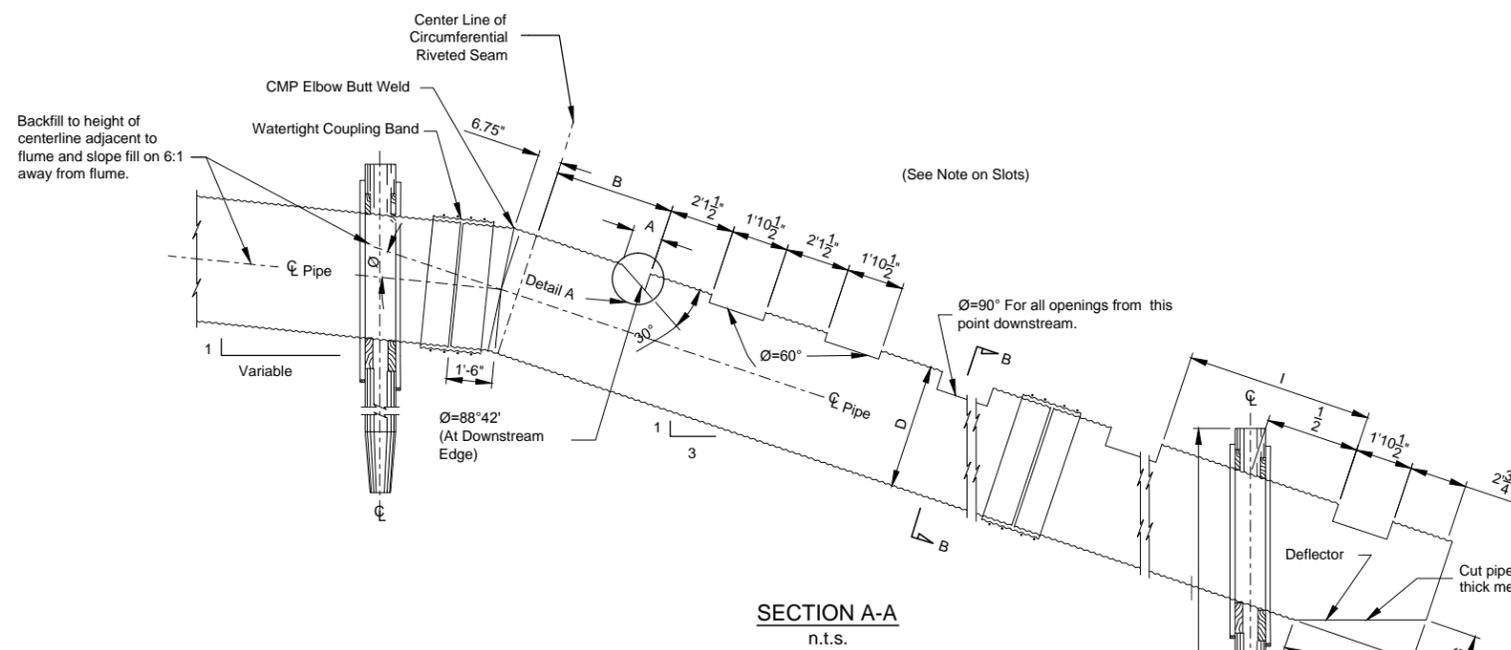


Pipe Dia.	15"	18"	21"	24"	30"	36"	42"	48"
A	0-3 3/4	0-4 1/2	0-5 3/4	0-6	0-7 1/2	0-9	0-10 1/2	1-0
B	1-11 1/4	1-11 1/4	1-11 1/4	1-11 1/4	3-11 1/4	3-11 1/4	3-11 1/4	3-11 1/4
C	0-6	0-7 1/4	0-8 3/8	0-9 5/8	1-0	1-2 3/8	1-4 3/4	1-7 1/4
D	1-3	1-6	1-9	2-0	2-6	3-0	3-6	4-0
E	0-1 7/8	0-2 1/4	0-2 5/8	0-3	0-3 3/4	0-4 1/2	0-5 1/4	0-6
F	0-5 5/8	0-6 3/4	0-7 7/8	0-9	0-11 1/4	1-1 1/2	1-3 3/4	1-6
G	0-5	0-6	0-7	0-8	0-10	1-0	1-2	1-4
H	0-0 5/8	0-0 5/8	0-0 5/8	0-0 5/8	0-0 5/8	0-0 5/8	0-0 5/8	0-0 5/8
I	2-1 1/2	2-1 1/2	2-1 1/2	2-1 1/2	2-1 1/2	2-1 1/2	6-1 1/2	6-1 1/2
X	0-1 1/4	0-1 1/2	0-1 3/4	0-2 1/8	0-2 5/8	0-3 3/8	0-3 5/8	0-4 1/8
Y	0-2 1/8	0-2 5/8	0-3	0-3 1/2	0-4 3/8	0-5 1/4	0-6	0-6 7/8
Z(Ø=60°)	0-7 7/8	0-9 3/8	0-11	1-0 5/8	1-3 3/4	1-6 7/8	1-10	2-1 1/8
Z(Ø=88° 42")	0-11 5/8	1-1 7/8	1-4 1/4	1-6 5/8	1-11 1/4	2-3 7/8	2-8 1/2	3-1 1/8
Z(Ø=90°)	0-11 3/4	1-2 5/8	1-4 1/2	1-6 1/8	1-11 5/8	2-4 1/4	2-9	3-1 3/4
Ø 1/								



☐ - Must be completed and entered into table.

Notes:
Corrugated metal pipe shall be Type 1, Shape 1 conforming to Construction Specification 51. Corrugated metal pipe, NRCS National Engineering Handbook, Part 642, Specifications for Construction Contracts. Fabricated metal plates shall be compatible material.
All coupling bands upstream of the elbow shall be watertight and shall be 2 feet wide annular corrugated bands with 12 inch wide neoprene gasket and four rods and tank lugs.
Neoprene gaskets shall be 3/8" thick, have an unstretched diameter 10 percent less than the nominal pipe size and shall comply with ASTM D-1056, Grade SCE-43.
All slots shall be spaced similarly downstream with ends of pipe sections fabricated as shown. All slots shall measure 1'-10 1/2" longitudinally along the pipe. Where riveted pipe is used, cut from the single thickness leaving the the slots shall be lapped area undisturbed.

Standardized Design:
Adapted from "Tests of a Slotted-Flume Outlet" by Phillips and Jacobson, Transactions of the ASAE, vol. 9, no. 3, pp. 433 thru 436, 1966, and standard drawings by NRCS, Des Moines, Iowa. Revision of Std. Drawing SNTC-11 dated 12-86. Must be adapted to specific site. Refer to instructions for use and design assumptions. A folder containing design notes and computations is available at NRCS, P.O. Box 141510 Gainesville, FL 32614-1510

Instructions for Use:
Applications should be restricted to the range of model studies performed by the Institute of Hydraulic Research, State University of Iowa, as discussed in the Transactions of the ASAE paper, "Tests of a Slotted-Flume Outlet", by Phillips and Jacobson, 1966.
Lengths of piling must be determined based on site conditions and construction methods.
Sites with unstable outlets should be closely monitored to avoid loss of earth support to the CMP upstream of the Outlet Support.

Design Assumptions:
Maximum discharge is based on 25 feet of head acting on 100 feet of CMP.
Total loading for Outlet Support is based on 12 linear feet of CMP and water from maximum discharge above including impact force on deflector. Loadings used were 965, 1425, 1875, 2550, 4190, 6260, 9220, and 13210 lbs. for 15 through 48 inch pipes respectively.

Date _____
Designed _____
Drawn _____
Checked _____
Approved _____

Slotted Flume Outlet



File No. FL-410A1.dwg
Drawing No. _____

Revisions		
Date	Approved	Title

Sheet 1 of 2

Slotted Flume Outlet

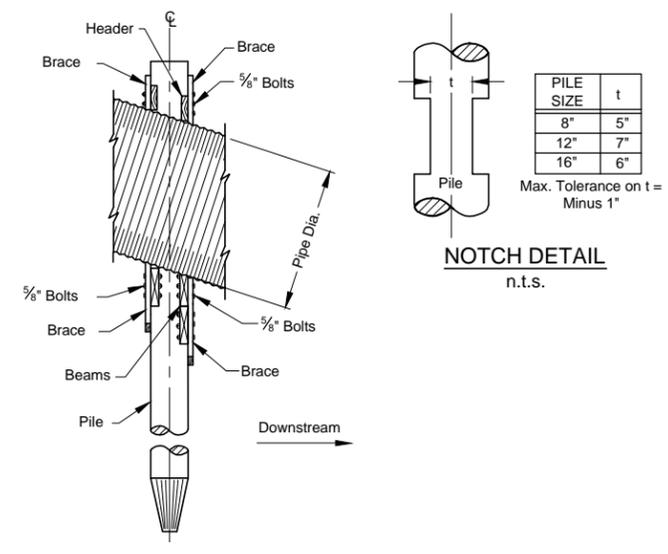
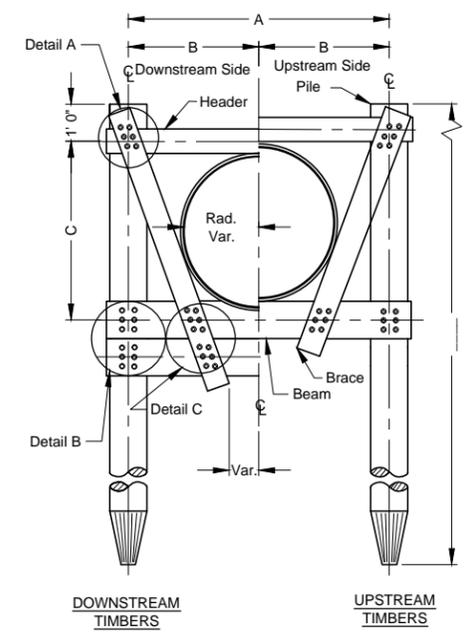
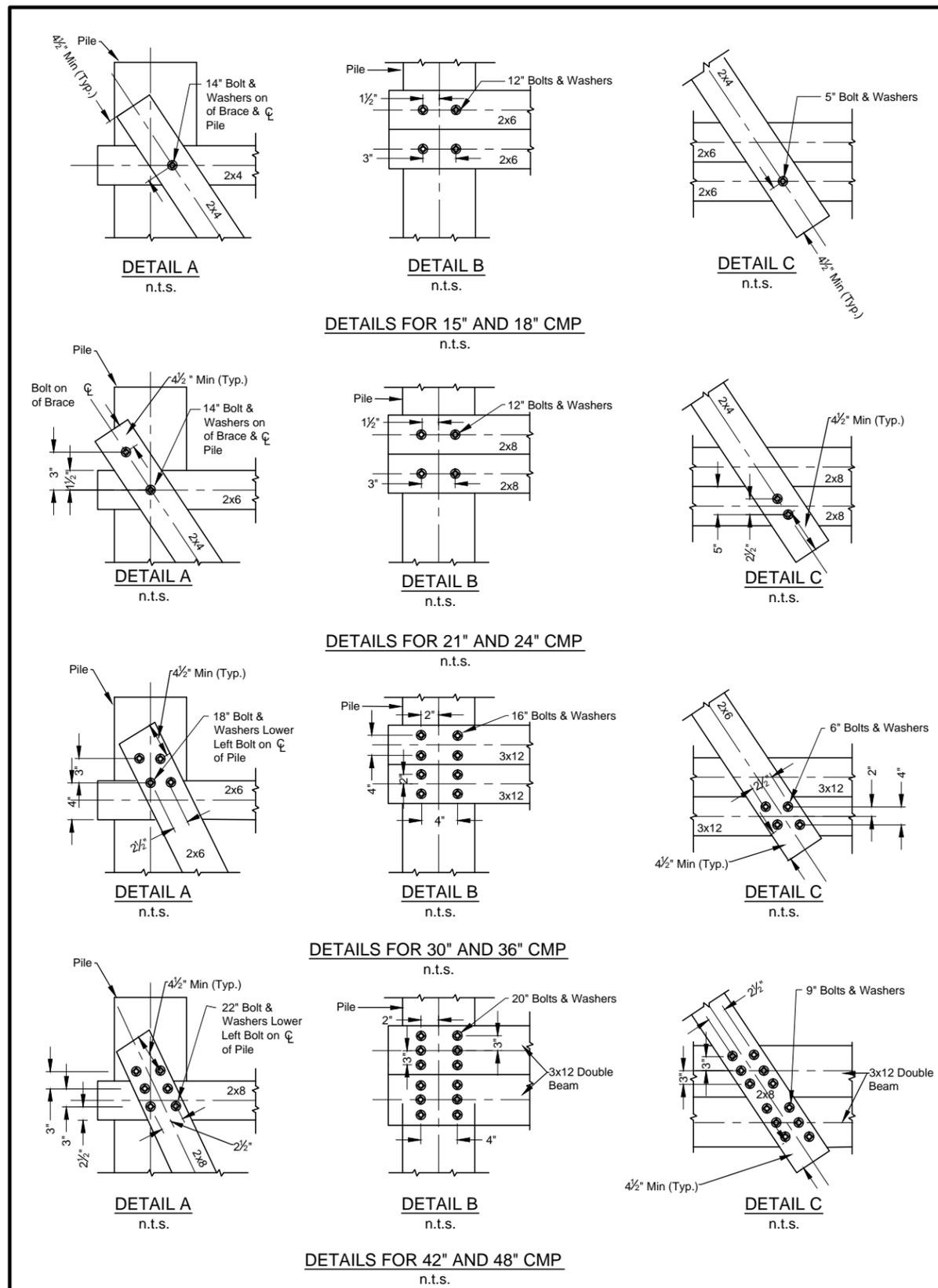
Standard DWG. No. FL-410A1.dwg
Date _____ Sheet 1 of 2

Date _____
 Designed _____
 Drawn _____
 Checked _____
 Approved _____

Slotted Flume Support Details



File No. FL-410A1.dwg
 Drawing No. _____
 Sheet 2 of 2



Pipe Diameter(Inches)		15	18	21	24	30	36	42	48
Item	Size	Qty	Item Lengths (Ft.&In.)						
* * Piles	* 25"	2							
* * Piles	* 38"	2							
* * Piles	* 50"	2							
Headers	2x4	1	3-6	4-6					
Headers	2x6	1			5-0	5-0	7-0	7-0	
Headers	2x8	1						8-0	9-0
Braces	2x4	4	3-6	4-0	4-6	5-0			
Braces	2x6	4				6-0	7-0		
Braces	2x8	4						7-6	8-6
Beams	2x6	3	3-6	4-6					
Beams	2x8	3			5-0	5-0			
Beams	3x12	3				7-0	7-0		
Beams	3x12	6						8-0	9-0
Bolts w/Nuts	5/8" Ø	4	0-5	0-5					
Bolts w/Nuts	5/8" Ø	8			0-5	0-5			
Bolts w/Nuts	5/8" Ø	16					0-6	0-6	
Bolts w/Nuts	5/8" Ø	24						0-9	0-9
Bolts w/Nuts	5/8" Ø	2	1-2	1-2					
Bolts w/Nuts	5/8" Ø	4			1-2	1-2			
Bolts w/Nuts	5/8" Ø	8					1-6	1-6	
Bolts w/Nuts	5/8" Ø	12						1-10	1-10
Bolts w/Nuts	5/8" Ø	8	1-0	1-0					
Bolts w/Nuts	5/8" Ø	8			1-0	1-0			
Bolts w/Nuts	5/8" Ø	16					1-4	1-4	
Bolts w/Nuts	5/8" Ø	24						1-8	1-8
Flat Washers	5/8" Ø	28	✓	✓					
Flat Washers	5/8" Ø	40			✓	✓			
Flat Washers	5/8" Ø	80					✓	✓	
Flat Washers	5/8" Ø	120						✓	✓

Pipe Diam.(In.)	A	B	C*
15	2'-4"	1'-2"	1'-11"
18	2'-8"	1'-4"	2'-2"
21	3'-4"	1'-8"	2'-5"
24	3'-8"	1'-10"	2'-8"
30	4'-8"	2'-4"	3'-6"
36	5'-4"	2'-8"	4'-0"
42	6'-0"	3'-0"	4'-6"
48	7'-2"	3'-7"	5'-0"

* MAXIMUM ALLOWABLE LENGTH

NOTES:

Lumber shall be Southern Pine (unfinished surface), No. 2 Dense (MC+19), in conformance with the latest edition of grading rules by the Southern Pine Inspection Bureau.

Timber Piles shall meet the requirements of ASTM D25-99 and shall be Class B, Southern Pine.

Timber piles shall be treated in conformance with ASTM D 1760. The prescribed pressure treatment shall be stated in the specifications.

Braces and Headers shall be placed against and bolted tangent to the pipe.

Washers shall be circular cut washers conforming to the requirements of A.S.T.M. Specification A-36. Bolts shall conform to A.S.T.M. Specification A-307. Bolts, nuts, and washers shall be hot dip zinc coated in accordance with the requirements of class C, A.S.T.M. Specification A-153, or stain-less steel class 304 or 316. Bolts shall have a 6 inch minimum thread length.

Beams will be placed face to face for 42" and 48" CMP.

Notch the top of the upper downstream Beam to fit the slope of the Pipe. (See Typical Bent Elevation)

* Minimum circumference 3 feet from butt
 ** NOTE: Enter actual length of piling based on site conditions.

Slotted Flume Support Details
 Standard DWG. No. FL-410A1.dwg
 Date _____ Sheet 2 of 2

Revisions		
Date	Approved	Title