United States
Department of
Agriculture

Soil
Conservation
Service

693 Federal Building
210 Walnut Street
Des Moines, IA 50309

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ENGINEERING FIELD MANUAL
IA210-ENG - AMENDMENT IA30, CHAPTERS 6, 8 AND 17

Purpose. To transmit pages IA6-15(9 and 10), IA6-54(1 thru 4), IA8-103(39 and 40), IA8-103(45 thru 48) and IA17-54(9.1 and 9.2).

Effective Date. This amendment is effective upon receipt.

Filing Instructions. These pages should be filed in the EFM to replace corresponding pages having an earlier date. Superseded material should be removed from the file and discarded.

This amendment adds the effective range for slug flow in a hood inlet, corrects errors in dimensions for aluminum drop spillway, corrects errors in terrace chart for 20 ft. stakeline and intake capacity chart, and adds to the prequalified list for plastic tile.

Each copy of the EFM should have these pages. Additional copies may be ordered from the State Office. This transmittal may be destroyed when it has been documented on the directive tabulation sheet and the material has been filed.

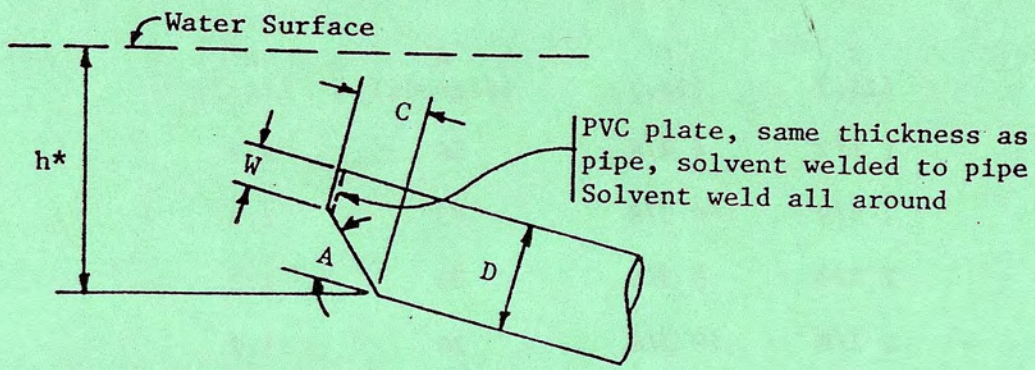
J. Michael Nethery
J. Michael Nethery
State Conservationist

Attachments

IA17-54(9.1 and 9.2)
is superceded by
Amendment IA35

A
F
EN3
MNTC - 5
DSC - 2 (Krishan, Lindquist)
SCE - Midwest States

CANOPY INLET ON PVC PIPE



*Minimum height for full pipe flow

PIPE FLOW FORMULA

$$Q = a\sqrt{\frac{2gH}{1 + K_e + k_m + \Sigma K_p L}}$$

$K_e = 1.0$,

$K_m = n\alpha/3$ (for $\alpha \leq 30°$)

(When entire length of conduit is on same slope, $K_m = 0$)

SYMBOLS

- Q = Discharge, cfs
- D = Inside diameter of pipe, inches
- α = Deflection angle in the pipe, degrees
- h = Water height over invert of inlet, feet
- a = Area of pipe, square feet
- H = Total available head, feet
- K_e = Entrance loss coefficient
- K_m = Miter-bend loss coefficient
- K_p = Pipe friction loss coefficient
- L = Length of pipe, feet
- g = Acceleration of gravity = 32.2 ft/sec^2
- n = Manning's roughness coefficient for pipe = 0.010 for smooth pipe
- W = PVC plate width, inches
- C = Canopy length, inches
- A = Angle of inlet bevel, degrees

CANOPY INLET DIMENSIONS

D (in.)	Pipe Grade %	W (in.)	C (in.)	A (degrees)	h* (ft.)
6	0-5	1 1/8	3 1/4	56	0.9
6	5.1-15	1 1/4	4 7/8	45	0.9
6	15.1-25	1 5/8	6 5/8	33	0.9
6	25.1-32	2 1/8	7 7/8	26	0.9

CANOPY INLET DIMENSIONS

D (in.)	Pipe Grade %	W (in.)	C (in.)	A (degrees)	h* (ft.)
8	0-5	1 1/2	4 3/8	56	1.2
8	5.1-15	1 5/8	6 3/8	45	1.2
8	15.1-25	2 1/8	8 3/4	33	1.2
8	25.1-32	2 7/8	10 3/8	26	1.2
10	0-5	1 7/8	5 3/8	56	1.5
10	5.1-15	2	8	45	1.5
10	15.1-25	2 5/8	11	33	1.5
10	25.1-32	3 1/2	13	26	1.5
12	0-5	2 1/4	6 1/2	56	1.8
12	5.1-15	2 3/8	9 5/8	45	1.8
12	15.1-25	3 1/4	13 1/4	33	1.8
12	25.1-32	4 1/4	15 5/8	26	1.8