

APPENDIX B

NOTATION

Symbol	Term	Units
a	Length of miter bend segment	ft
A	Cross-sectional area (subscripts denote locations)	ft ²
B	Width (in breadth)	ft
c	Distance in fillet detail	ft
C	Circular shape	--
	Discharge coefficient	--
	Pressure drop coefficient (subscripts denote dimension of flow)	--
	Celerity (velocity) of pressure wave	ft/sec
	Resistance coefficient in Chezy's equation	ft ^{1/2} /sec
	Relative loss coefficient	--
	Half width of conduit	ft
	Critical-slope surface profile (subscripts denote relation to depth)	--
C _c	Contraction coefficient	--
* C _k	Conveyance factor (1.486 AR ^{2/3})	ft ^{19/6} /sec *
* C _m	Coefficient for modified center-line trajectory for stilling basins subject to low-flow eddies	-- *
C _p	Pressure drop parameter	--
CORPS	<u>C</u> onversationally <u>O</u> riented <u>R</u> eal-Time <u>P</u> rogram- <u>G</u> enerating <u>S</u> ystem	--
d	Diameter	ft
	Depth of flow	ft
d ₁	Depth of flow entering hydraulic jump	ft

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(Sheet 1 of 8)

EM 1110-2-1602
 Change 1
 15 Mar 87

NOTATION

Symbol	Term	Units
d_2	Depth of flow leaving hydraulic jump	ft
dy/dx	Differential of y with respect to x	ft/ft
D	Diameter or height of conduit (subscripts denote locations)	ft
	Dimension of conduit in plane of entrance curve	ft
	Valve diameter	ft
	Depth of gate slot	ft
D_h	Equivalent hydraulic diameter ($=4 \times$ hydraulic radius)	ft
D_{50}	Median diameter of riprap stone (by weight)	ft
e	Half of transition wall conveyance	ft
E	Modulus of elasticity	lb/ft ²
	Gate passage invert elevation	ft msl
EGL	Energy grade line	--
f	Resistance coefficient (factor) in Darcy-Weisbach formula	--
f_f	Forcing frequency	H_z
f_n	Natural frequency	H_z
F	Froude number	--
g	Gravitational acceleration	ft/sec ²
G_o	Gate opening	ft
h_b	Bend loss	ft
h_e	Entrance (intake) loss	ft

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(Sheet 2 of 8)

NOTATION

Symbol	Term	Units
h_f	Head loss due to surface resistance (friction)	ft
h_l	Head loss due to form	ft
h_o	Pressure head in undisturbed flow	ft
h_v	Velocity head	ft
	Vapor pressure	ft
H	Total energy head	ft
	Horseshoe shape	--
	Height of conduit or wall	ft
	Piezometric head	ft
	Horizontal	--
	Horizontal channel surface profile (subscripts denote relation to depth)	--
H_d	Pressure drop	ft
H_D	Pressure drop	ft
H_e	Energy head	ft
H_i	Minimum piezometric head	ft
H_L	Total head loss (subscripts denote locations)	ft
H_v	Velocity head	ft
k	Roughness height	ft
K	Loss coefficient (subscripts denote type)	--
l	Length of cable	ft
L	Length of conduit	ft
	Distance along conduit	ft

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(Sheet 3 of 8)

NOTATION

Symbol	Term	Units
L_B	Length of basic	ft
L_e	Equivalent conduit length	ft
L_f	Length of fillet	ft
L_p	Plate width	ft
L_t	Length of tangent	ft
L_T	Length of transition	ft
LN	Natural logarithm (base e)	--
M	Mild-slope surface profile (subscripts denote relation to depth)	--
	Momentum	ft ³
	Model data	--
n	Resistance coefficient in Manning's formula	ft ^{1/6}
O	Oblong shape	--
p	Pressure (subscripts denote locations)	lb/ft ²
p_v	Vapor pressure	lb/ft ²
P	Wetted perimeter	ft
	Offset distance	ft
	Prototype data	--
	Number of gate passages	--
PC	Point of curvature	--
PI	Point of intersection of tangents	--
PT	Point of tangency	--

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(Sheet 4 of 8)

15 Oct 80

NOTATION

Symbol	Term	Units
PCC	Point of compound curvature	--
PGL	Piezometric grade line	--
PRC	Point of reverse curvature	--
Q	Discharge	ft ³ /sec
Q _a	Air demand	ft ³ /sec
Q _w	Water discharge	ft ³ /sec
r	Curve radius (subscripts denote locations)	ft
r _a	Arc radius	ft
r _f	Fillet radius	ft
R	Hydraulic radius	ft
	Rectangular shape	--
	Curve radius (subscripts denote locations)	ft
	Radial offset distance	ft
IR	Reynolds number, $IR = VD/\nu$	--
S	Average loss of head per unit of length (energy gradient slope)	ft/ft
	Steep-slope surface profile (subscripts denote relation to depth)	--
	Submergence	ft
	Conduit invert slope	ft/ft
S _f	Friction slope	ft/ft
S _t	Strouhal number	--

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(Sheet 5 of 8)

15 Oct 80

NOTATION

Symbol	Term	Units
S_{cn}	Critical slope for normal depth	ft/ft
t	Gate leaf thickness	ft
t_h	Local transition half height	ft
t_w	Local transition half width	ft
T	Temperature	°F
	Width of water surface	ft
V	Average (mean) velocity (subscripts denote locations)	ft/sec
	Vertical	--
V_{sm}	Average (mean) velocity for smooth pipe flow	ft/sec
W	Conduit width	ft
	Gate slot width	ft
W_b	Width of basin	ft
W_s	Local width of basin on sloping apron	ft
W_{50}	Median weight of riprap stone	lb
x	Vibration amplitude	ft
	Horizontal or longitudinal coordinate or distance	ft
x_o	Zero frequency deflection	ft
X	Horizontal or longitudinal coordinate or distance (subscripts denote locations)	ft
y	Vertical or transverse coordinate or distance	ft
	Depth of flow (subscripts denote locations)	ft

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(Sheet 6 of 8)

NOTATION

Symbol	Term	Units
y_c	Critical depth	ft
y_o	Normal depth	ft
y_p	Height of pressure grade line at exit portal	ft
\bar{y}	Average piezometric pressure	ft
* y'	Vertical coordinate	ft *
Y	Vertical or transverse coordinate or distance	ft
	Projection of gate into conduit	ft
Z	Elevation above datum plane (subscripts denote locations)	ft
	Section factor	ft ^{5/2}
α	Kinetic energy correction factor (subscripts denote locations)	—
β	Angular distance to location of H_i	deg
	Gate lip angle	deg
γ	Specific (unit) weight	lb/ft ³
ΔA	Change in area	ft ²
ΔB	Increment of width	ft
ΔL	Flare ratio of stilling basin sidewall	ft/ft
	Length of reach between two sections	ft
ΔP	Pressure difference	ft
n	Depth ratio (y/y_o)	ft/ft

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(Sheet 7 of 8)

EM 1110-2-1602
 Change 1
 15 Mar 87

NOTATION

Symbol	Term	Units
θ	Conduit invert slope	deg
	Boundary contraction or expansion angle	deg
	Angular displacement or deflection	deg
θ_p	Slope of tangent extension from pier	deg
ν	Kinematic viscosity	ft ² /sec
π	3.14159	--
σ	Root-mean-square of random roughness height	ft
	Unit stress in cable	lb/ft ²
	Interfacial surface tension	lb/ft
σ	Cavitation number or index	--
σ_i	Incipient cavitation number	--
ϕ	Flare angle of stilling basin sidewall	deg
\underline{c}	Center line	--
$^{\circ}\text{F}$	Fahrenheit temperature	deg
>	Greater than	--
<	Less than	--