

SYMBOL	DEFINITION	UNITS
A	Cross-sectional area of flow	ft ²
α	Velocity distribution coefficient	-
C	Stone size correction factor	-
C _{sg}	Adjustment to the specific gravity of stone	-
C _{SF}	Adjustment to the stability factor	-
d	Depth of flow	ft
D _{50s}	Required D ₅₀ for side slopes	ft
d _c	Critical depth	ft
d _n	Normal depth	ft
d _{avg}	Average flow depth in the main channel	ft
E	Specific energy	ft
F _r	Froude Number	-
g	Acceleration due to gravity	ft/s ²
h _L	Total head loss due to local minor and friction losses	ft
h	Stage or head	ft
h _f	Friction loss	ft
H _D	Average hydraulic depth	ft
h _o	Summation of minor losses	ft
K	Channel conveyance	-
L	Discharge-weighted or conveyance reach length	ft
n	Manning's roughness coefficient	-
P	Wetted perimeter	ft
Q	Discharge	cfs
R	Hydraulic radius	ft
S _o	Channel slope	ft/ft
S	Slope of the energy grade line	ft/ft
S _A	Average slope of the energy grade line	ft/ft
S _g	Specific gravity of rock riprap	-
SF	Stability factor applied	-
T	Top width at the water surface	ft
τ_o	Average tractive force	lbs/ft ²
τ_{max}	Maximum tractive force	lbs/ft ²
τ_p	Permissible shear stress	lbs/ft ²
τ_s	Side slope shear stress	lbs/ft ²
TW	Tailwater depth above invert of culvert	ft
V	Mean velocity	ft/s
V _a	Average velocity in main channel	ft/s
Z	Elevation head	ft
S _f	Mean slope of the energy grade line	ft/ft
γ	Unit weight of water	lb/ft ³
θ	Side slope angle	deg.
ϕ	Angle of repose of material	deg.