Road Gutter Flow Spread (Izzard Equation)

Width of flow spread and depth at the kerb of stormwater in a triangular road gutter from the flow, cross slope and longitudinal slope.

Method: Modified Manning (Izzard) equation for triangular gutters

Input parameters

Unit system: SI

Parameter	Value	Unit
Gutter flow	50.000	L/s
Manning's n of the gutter and pavement	0.016000	
Pavement cross slope	2.0000	%
Longitudinal slope	1.0000	%
Allowable spread (0 = skip check)	3.0000	m

Calculated results

Parameter	Value	Unit
Spread of flow from the kerb	2.7216	m
Depth at the kerb	54.431	mm
Mean velocity	0.67504	m/s
Flow at the allowable spread	64.830	L/s

Notes for this case

• Manning's equation integrated across a triangular section gives Q = (K_u/n) S_x^(5/3) S_L^(1/2) T^(8/3) with K_u = 0.376 in SI units, so the spread grows only with Q^(3/8). Drainage design limits the spread so that a traffic lane stays open; inlets are placed where the gutter flow reaches the allowable spread. Flatter cross slopes spread water much wider.

Formula and method

$$Q = \frac{K_u}{n} S_x^{5/3} S_L^{1/2} T^{8/3}, \quad K_u = 0.376, \quad d = T S_x$$

Variables

Q	Gutter flow	m³/s
n	Manning's n of the gutter and pavement	-
S_x	Pavement cross slope	-
S_L	Longitudinal slope	-
T_{allow}	Allowable spread (0 = skip check)	m
T	Spread of flow from the kerb	m
d	Depth at the kerb	m
V	Mean velocity	m/s
Q_{allow}	Flow at the allowable spread	m³/s

Method and standards

Gutter flow.

Assumptions and limits

- Uniform triangular section; steady flow.

References

Modified Manning (Izzard) equation for triangular gutters

Report details

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Release checks	3 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/civil/hydraulics/gutter-flow-spread

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.