RCC Staircase Concrete, Formwork and Steel Quantity

Concrete volume of a reinforced concrete stair flight (waist slab and steps) and landing, soffit formwork area and an estimate of reinforcement weight.

Method: Quantity take-off of stair flights; Standard quantity surveying practice

Input parameters

Unit system: SI

Parameter	Value	Unit
Riser height	150.00	mm
Tread (going)	300.00	mm
Number of steps in the flight	10.000	
Stair width	1.2000	m
Waist slab thickness	150.00	mm
Landing length	1.2000	m
Landing thickness	150.00	mm
Steel per m³ of concrete	90.000	kg/m³

Calculated results

Parameter	Value	Unit
Sloping length of the flight	3.3541	m
Waist slab concrete	0.60374	m³
Steps concrete	0.27000	m³
Total concrete (flight and landing)	1.0897	m³
Soffit formwork	5.4649	m²
Reinforcement estimate	98.076	kg

Notes for this case

• Waist slab measured perpendicular to the soffit along the sloping length n√(R² + T²); each step adds a triangle ½RT·w. Side formwork to the stringers and steps adds to the soffit area; use the bar schedule for exact steel.

Formula and method

$$L_s = n\sqrt{R^2 + T^2}, \quad V = L_s t_w w + n\frac{1}{2}RTw + L_l t_l w$$

Variables

R	Riser height	m
T	Tread (going)	m
n	Number of steps in the flight	-
w	Stair width	m
t_w	Waist slab thickness	m
L_l	Landing length	m
t_l	Landing thickness	m
r_s	Steel per m³ of concrete	kg/m³
L_s	Sloping length of the flight	m
V_w	Waist slab concrete	m³

V_s	Steps concrete	m³
V	Total concrete (flight and landing)	m³
A_f	Soffit formwork	m²
m_s	Reinforcement estimate	kg

Method and standards

Stair quantities.

Assumptions and limits

- Straight flight; uniform steps.

References

Quantity take-off of stair flights, Standard quantity surveying practice

Report details

Report reference	FCC-16P4-0WMJ (the same inputs always give the same reference)
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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/quantities/staircase-concrete-quantity

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.