Concrete Volume of Footings, Columns, Beams and Slabs

Concrete volume of a set of rectangular footings, columns, beams and a slab from their sizes and numbers, with the total and the volume ordered with wastage.

Method: Volume of rectangular members (Common site practice (quantity estimating))

Input parameters

Unit system: SI

Parameter	Value	Unit
Footing length	1.8000	m
Footing width	1.8000	m
Footing depth	0.45000	m
Number of footings	12.000	
Column width	0.30000	m
Column depth	0.45000	m
Column height	3.6000	m
Number of columns	12.000	
Beam width	0.23000	m
Beam depth below the slab	0.33000	m
Total length of beams	96.000	m
Slab area	180.00	m^2
Slab thickness	0.15000	m
Wastage allowance	3.0000	%

Calculated results

Parameter	Value	Unit
Footings	17.496	m^3
Columns	5.8320	m^3
Beams	7.2864	m^3
Slab	27.000	m^3
Total	57.614	m^3
Volume to order (with wastage)	59.343	m^3

Notes for this case

• Beam depth below the slab avoids counting the slab twice; column height between the footing top and the beam soffit likewise. Measure beam lengths as clear spans between columns: centre-to-centre lengths count the beam–column joints twice.

Formula and method

$$V = \sum n\,LBD + \sum n\,bdh + b_b d_b L_b + A_s t_s, \quad V_o = V(1 + k_w)$$

Variables

L_f	Footing length	m
B_f	Footing width	m
D_f	Footing depth	m
n_f	Number of footings	-

b_c	Column width	m
d_c	Column depth	m
h_c	Column height	m
n_c	Number of columns	-
b_b	Beam width	m
d_b	Beam depth below the slab	m
L_b	Total length of beams	m
A_s	Slab area	m²
t_s	Slab thickness	m
k_w	Wastage allowance	-
V_f	Footings	m³
V_c	Columns	m³
V_b	Beams	m³
V_s	Slab	m³
V	Total	m³
V_o	Volume to order (with wastage)	m³

Method and standards

Volumes of prisms.

Assumptions and limits

- Rectangular members.
- Column height from the footing top to the beam soffit; beam lengths as clear spans between columns. Centre-to-centre beam lengths count each beam–column joint (b_b × d_b × column width) twice.

References

• Volume of rectangular members (Common site practice (quantity estimating))

Report details

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

This calculator online

https://calc.firecad.com/civil/concrete/concrete-volume-members

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.