

Electrical Duct Bank Concrete Volume Calculator

Calculate duct-bank envelope volume, conduit void volume, concrete volume, and waste-adjusted order quantity from verified layout dimensions.

Generated October 10, 2026

<https://www.elecatrix.com/wire-raceway-ampacity/duct-bank-concrete-volume-calculator/>

Inputs

Input	Value	Unit
Duct-bank length	100	ft
Conduit rows	2	rows
Conduits per row	3	conduits
Conduit outside diameter	4	in
Horizontal clearance between conduits	2	in
Vertical clearance between rows	2	in
Concrete cover around envelope	3	in
Concrete waste allowance	5	%

Results

Result	Value	Unit
Total conduit count	6	conduits
Gross envelope width	22	in
Gross envelope height	16	in
Gross envelope volume	20.3704	ft^3
Conduit void volume	4.3633	ft^3
Concrete volume	16.007	ft^3
Concrete volume	0.5929	yd^3
Waste-adjusted order volume	0.6225	yd^3

Calculation details

Detail	Value	Unit
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Calculation basis

The entered rectangular envelope is reduced by the cylindrical void volume of the entered conduits. Waste is applied only to the resulting concrete quantity.

Duct-bank boundary

Estimating quantity only; verify utility standards, cover, spacing, conduit arrangement, trench conditions, concrete specification, end blocks, forms, and project drawings separately.

Formulas

$$W_{gross} = n_{rowd} + (n_{row} - 1)s_h + 2c$$

$$H_{gross} = n_{rowsd} + (n_{rows} - 1)s_v + 2c$$

$$V_{envelope} = \frac{W_{gross}H_{gross}L}{1728}$$

$$V_{void} = \frac{\pi(d/2)^2n_{total}L}{1728}$$

$$V_{concrete} = V_{envelope} - V_{void}$$

$$V_{order} = V_{concrete}(1 + (w/100))$$

Warnings and limitations

This is an estimating quantity calculator. It does not select duct-bank geometry, verify cover or spacing, specify concrete mix, determine utility acceptance, or approve a civil/electrical installation.