Bulking of Sand: Volume Correction for Batching by Volume

Bulking of damp sand from a cylinder test (damp and inundated heights), and the extra sand volume to batch so the mix gets its intended dry sand.

Method: Field method for bulking of sand (IS 2386 Part 3 principle)

Input parameters

Unit system: SI

Parameter	Value	Unit
Height of damp sand in the container	200.00	mm
Height after flooding with water (inundated)	165.00	mm
Sand volume required by the mix (dry, loose)	0.50000	m³

Calculated results

Parameter	Value	Unit
Bulking $(h_1 - h_2)/h_2$	21.212	%
Damp sand volume to batch V(1 + β)	0.60606	m³

Formula and method

$$\beta = \frac{h_1 - h_2}{h_2}, \quad V_b = V(1 + \beta)$$

Variables

h_1	Height of damp sand in the container	m
h_2	Height after flooding with water (inundated)	m
V	Sand volume required by the mix (dry, loose)	m³
β	Bulking $(h_1 - h_2)/h_2$	-
V_b	Damp sand volume to batch V(1 + β)	m³

Method and standards

Volume ratio of damp to inundated sand.

Assumptions and limits

- Field test.
- The inundated volume stands in for the dry loose volume of the mix design (flooded sand occupies about the same volume as dry sand), so V is the dry, loose volume and the damp volume to batch is V(1 + β).

References

- Field method for bulking of sand (IS 2386 Part 3 principle)

Report details

Report reference	FCC-QGFR-EPXZ (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/concrete/bulking-of-sand

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.