

ACI 211.1-22 Concrete Mix Design

ACI 211.1-22 Concrete Mix Design V2025.1

Reference

Input Parameters

Compressive Strength f_c (psi)	2500
Slump (in)	4
Max Aggregate Size (in)	1.5
Fineness Modulus of Sand	2.8
Specific Gravity - Cement	3.15
Specific Gravity - Coarse Agg	2.68
Specific Gravity - Fine Agg	2.64
Absorption - Coarse Agg (%)	0.5
Absorption - Fine Agg (%)	0.7
Moisture - Coarse Agg (%)	2
Moisture - Fine Agg (%)	6
Dry-rodded density of coarse aggreg	100
Exposure Class	Mild
Air-Entrained?	No

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Mix Design Results

Mix Design Results:

Water: 202.3939942857146 lb/yd³

Cement: 483.9 lb/yd³

Water-Cement Ratio: 0.62

Air Content: 1.0%

Fine Aggregate: 1376.9 lb/yd³ (adjusted)

Coarse Aggregate: 1955.3 lb/yd³ (adjusted)

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Table 9.2.8—Constituent weights

Mixture constituents	lb/yd ³	lb/ft ³
Mixing water	202	7.48
Cementitious materials	484	17.93
Coarse aggregate (SSD)	1956	72.44
Fine aggregate (SSD)	1377	51.00
Total weight	4019	148.85
Fresh density	—	148.9
Air-free density	—	150.4

Table 9.2.9—Constituent weights

Mixture constituents	Original lb/ft ³	Batched lb/ft ³
Mixing water	7.48	8.50
Cementitious materials	17.93	17.93
Coarse aggregate (SSD)	72.44	72.44
Fine aggregate (SSD)	51.00	51.00
Total weight	148.85	149.87
Fresh density	148.9	147.5
Air-free density	150.4	—

Therefore, the water required for batching is

$$300 \text{ lb/yd}^3 - 98 \text{ lb/yd}^3 = 202 \text{ lb/yd}^3$$

With aggregates adjusted to their current moisture condition, the constituent weights are shown in Table 9.2.8.

Note that after the moisture adjustments, the sum of the weights of the constituents per cubic yard (yd³) and per

8.50 x 11.00 in