# OptiMix

# Air-entrained Concrete Mix Design Results

# Stage 1

* Specified characteristic strength = 30 N/mm2
* Curing age = 28 days
* Proportion defective = 10.0%
* Risk factor = 1.2815515655446006
* Standard deviation = 8.0 N/mm2
* Margin = 10.252412524356805 N/mm2
* Air content = 2.8%
* Compressive strength loss = 5.5%
* Target mean strength = 47.57968383493713 N/mm2
* Cement type: OPC
* Coarse aggregate type: Crushed
* Fine aggregate type: Crushed
* Approximate compressive strength for a water-cement ratio of 0.5 = 49.0 N/mm2
* Predetermined free-water/cement ratio = 0.5097538825388457
* Maximum free-water/cement ratio = 0.55

# Stage 2

* Slump category: 30-60mm
* Reduced slump category: 10-30mm
* Aggregate sizes: 10mm, 20mm
* Maximum aggregate size: 20mm
* Free-water content = 190 kg/m3

# Stage 3

* Calculated cement content = 372.72889233074375 kg/m3
* Maximum cement content = 0 kg/m3
* Minimum cement content = 200 kg/m3
* Final cement content = 372.72889233074375 kg/m3
* Modified free-water/cement ratio = 0.5097538825388457

# Stage 4

* Relative density of aggregate (SSD) = 2.7
* Concrete density from graphical interpolation = 2430.625 kg/m3
* Calculated concrete density = 2400.0 kg/m3
* Total aggregate content = 1837.2711076692563 kg/m3

# Stage 5

* Grading of fine aggregate (Percentage passing 600$\mu$m) = 18.0%
* Proportion of fine aggregate = 46.14837865624943%
* Fine aggregate reduction = 5%
* Fine aggregate content = 756.0072723256137 kg/m3
* Coarse Aggregate content = 1081.2638353436425 kg/m3

### Aggregate batching (SSD)

Fine aggregate content (SSD): 756.0072723256137 kg/m3Coarse aggregate content (SSD): 1081.2638353436425 kg/m3

### Oven dry batching

Absorption of fine aggregate = 0%  
Absorption of coarse aggregate = 0%  
Fine aggregate content (oven-dry) = 0 kg/m3Coarse aggregate content (oven-dry) = 0 kg/m310mm: 360.4212784478808  
20mm: 720.8425568957616  
40mm: 0   
Additional mass of water = 0   
Water content = 190 kg/m3

# Quantity Summary

## Quantity per m3 (to the nearest 5 kg)

* Cement: 375 kg
* Water: 190 kg
* Fine Aggregate 755 kg
* Coarse Aggregate 1080 kg

## Quantity per trial mix of 150 L

* Cement: 56.2 kg
* Water: 28.5 kg
* Fine Aggregate: 113.2 kg
* Coarse Aggregate: 162.0 kg