

**Dr. Vithalrao Vikhe Patil Foundation's
DR. VITHALRAO VIKHE PATIL COLLEGE OF ENGINEERING, AHMEDNAGAR**

Ref.No. : CEA/CED/TESTING/17-18/01

Date :- 30/06/2017

CONCRETE MIX DESIGN FOR M25 CONCRETE

**(100% Natural Sand)
(Ref. – IS – 10262 – 2009 Method)**

Name of Party & Address:- M/S Gaurav Engineers, Baramati

Subject :- Concrete Design M – 25 Grade .

Site – Mauli Doodh Sangh, Brahmani, Tal- Rahuri.

Ref.: -----

Date:-12/05/2017

Testing Charges Rs. – 10,000/-

Paid Vise Receipt No. : - 00337(Rs. 5000/-)

Date: - 12/05/2017

7995 (Rs. 15000/-)

Date:- 22/06/2017

(Rs. 15000, Cheque No. 292137 of Axis Bank dated on 05/06/2017)

CONCRETE MIX DESIGN

A] DESIGN STIPULATIONS.

a) Characteristic compressive strength

Required in the field at 28 days = 25 N/mm²

b) Maximum size of aggregate = 20 mm

c) Workability of concrete = Moderate

d) Compaction factor = 0.91

e) Degree of Quality control = Good

f) Type of Exposure = Moderate.

B] TEST DATA FOR MATERIALS:-

1] a) Type of cement

= Ultratech- PPC

b) 7 days compressive strength of cement

= 38.67 N/mm²

alc



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- c) Specific gravity of cement = 3.15
- d) Fineness of cement = 1 %
- e) Initial setting time = 75 min
- f) Final setting time = 204 min
- g) Soundness of cement = 1 mm

2] Aggregate and Sand –

Test property	Coarse Aggregate	Natural Sand
	20 mm	
Specific gravity	2.78	2.68
Water absorption, %	1.52	2.56
Moisture content, %	0.05	1.00
Crushing Value, %	20.13	--
Impact Value, %	8.28	--

3] Sieve analysis:-

a) Coarse Aggregate:-

20 mm size aggregates:

IS Sieve Size	% Passing
80 mm	100
40 mm	100
20 mm	31.02
10 mm	050
4.75 mm	0.10

b) Natural Sand:-

IS Sieve size	% Cumulative Passing	Confirming to Grading Zone – II Of Table 4 of I.S : 383 : 1970
10 mm	100	
4.75 mm	90	
2.36 mm	72	
1.18 mm	35.50	
0.600 mm	20	
0.300 mm	8	
0.150 mm	3	
0.75 mm (weight)	30 gms	
Pan Weight	20gms	

Fineness Modulus: 3.72



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C] TARGET MEAN STRENGTH:-

$$= 25 + 4 \times 1.65 = 31.6 \text{ N/mm}^2.$$

- 1) Water cement ratio = 0.50
- 2) Water content = 197 Kg / m³
- 3) Sand content = 40 %
- 4) Entrapped air in concrete = 2 %

D] Requirement per Cu. M. of concrete :-

- 1) Water content = 197 Lit
- 2) Sand content = 40 %
- 3) Cement content = 394 kg/m³

By IS 456 : 2000 Table No . 05 = 300 Kg/m³]

- 4) Entrapped air = 2 %

E] ACTUAL QUANTITIES REQUIRED FOR CU.M. OF CONCRETE IN KG .

Water : Cement : Natural Sand : Coarse Aggregate

197 : 394 : 726.82 : 1130.90

0.50 : 1 : 1.84 : 2.87

Mix proportion by mass:

Note :- After adjustment for absorption & surface moisture .

Mix No.	Quantities of materials per m ³ of concrete						Concrete characteristics Strength		
	Cement in kg	Water in Lit.	Natural Sand Kg	Coarse Aggregate 20 mm	W/C	Sand content %	Workability (CF)	Compressive Strength N/mm ²	
I	394	197	726.82	1130.90	0.50	40	0.91	7 days	28 days
II	492.50	197	693.58	1079.20	0.40	40	0.90	21.33	31.56
III	437.77	197	711.81	1107.55	0.45	40	0.89	23.41	33.33
								22.52	32.00

Adopt Trial Mix No. – III

Cement : Sand : Coarse Aggregate

437.77 : 711.81 : 1107.55

1 : 1.63 : 2.53

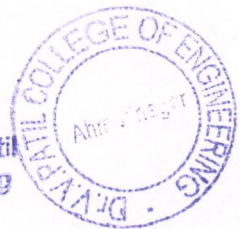
: W/C ratio

: 0.45

: 0.45



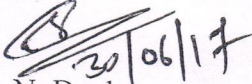
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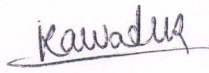
G) Actual quantities required per batch of cement in kg after adjustment for water absorption and surface moisture.

- 1) Cement = 50 kg
- 2) Natural Sand = 81.50 kg
- 3) Coarse Aggregate = 20 mm Fraction = 126.50kg
- 4) Water = 22.50 Lit.
- 5) W/C = 0.45

Tested By

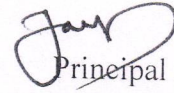

S. N. Daule

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H.O.D.

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Principal

Dr. V.V.P.C.O.E. Ahmednagar

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