Format No P013/MT/02

TEST REPORT

Rev. No.01

TEST REPORT ISSUED BY:**BHUBANESWAR LAB**
TEST REPORT NO.
TEST REPORT & ISSUE DATE:
DISCIPLINE : MECHANICAL TEST
CUSTOMER NAME & ADDRESS:
M/s. CAPPATERY PRIVATE LIMITED
Plot No. 316/5846, Niladri Vihar, Chandrasekharpur, Sailashree Vihar Road, Bhubaneswar, Khordha, Odisha-751021
Bhubaneswar

SAMPLE TESTED BY/AT:**BHUBANESWAR LAB**
BNR-1127-TR-790403
06/08/2025
GROUP NAME : BUILDING MATERIALS
PROJECT SITE ADDRESS:
Plot No. 316/5846, Niladri Vihar
Chandrasekharpur, Sailashree Vihar Road, Bhubaneswar, Khordha, Odisha-751021
Bhubaneswar

QUANTITY: 1 No(s)
DATE OF RECEIPT: 01/07/2025
CUSTOMER REF. NO & DATE: Order No. 35 & Dated : 28-06-2025
CONDITION OF SAMPLE ON RECEIPT: Ok
SOURCE OF SAMPLE AS GIVEN BY CUSTOMER: Concrete Mix Design
TEST METHOD: IS 10262 : 2019, IS 456-2000 RA 2021 Amd-5, IS 9013 : 1978 RA 2013

CONCRETE MIX DESIGN REPORT

PERIOD OF TEST: 02/07/2025 TO 04/08/2025

1. STIPULATION FOR PROPORTIONING

GRADE DESIGNATION: M-20	TYPE OF CONCRETE: RCC
TYPE OF CEMENT : OPC-53	
MAXIMUM NOMINAL SIZE OF AGGREGATE: 20 mm	EXPOSURE CONDITION: MODERATE
WORKABILITY(SLUMP): 160 mm	METHOD OF CONCRETE PLACING:PUMPABLE
TYPE OF AGGREGATE: ANGULAR	BRAND & PRODUCT NAME OF ADMIXTURE:GRAPHENE CONCRETE ADMIXTURE
RETENTION TIME (minutes): 60	TYPE OF ADMIXTURE: PC

2. TEST DATA:

DATA OF INGREDIENTS

Ingredients	Type of material	Source of materials	Average Specific Gravity	Water Absorption, %	DLBD, kg/l
Coarse Aggregate	20 mm	Gudhiakatani	2.89 (ssd condition)	0.16	1.54
	10 mm	Gudhiakatani	2.89 (ssd condition)	0.38	1.54
Fine aggregate	Natural Sand	Mahanadi	2.62 (ssd condition)	0.73	1.54
Cement	OPC-53	Ultratech	3.13	-	-
Admixture	PC	Capattery	1.08	-	-

RAW MATERIAL ANALYSIS USE FOR CONCRETE MIX

TYPE OF AGGREGATE : Natural Sand

IS SIEVE DESIGNATION (mm)	Percentage Retain Weight	Percentage Cumulative Retain Weight	Percentage Cumulative Passing Weight	Requirement of % Passing As Per IS 383 , Table No-9 for Fine Aggregate
10	0	0	100	100
4.75	0.7	0.7	99.3	90-100
2.36	2.7	3.4	96.6	75-100
1.18	11	14.4	85.6	55-90
0.6	31	45.4	54.6	35-59
0.3	33.5	78.9	21.1	8-30
0.15	19.2	98.1	1.9	0-10
CONFIRMS TO ZONE : II				

TYPE OF AGGREGATE : 20 mm

TEST REPORT NO. : BNR-1127-TR-790403

IS SIEVE DESIGNATION (mm)	Percentage Retain Weight	Percentage Cumulative Retain Weight	Percentage Cumulative Passing Weight	Requirement of % Passing As Per IS 383 , Table No-7 for Single Size Agg.
40	0	0	100	100
20	15.1	15.1	84.9	85 - 100
10	83.9	99	1	0 - 20
4.75	0.5	99.5	0.5	0 - 5

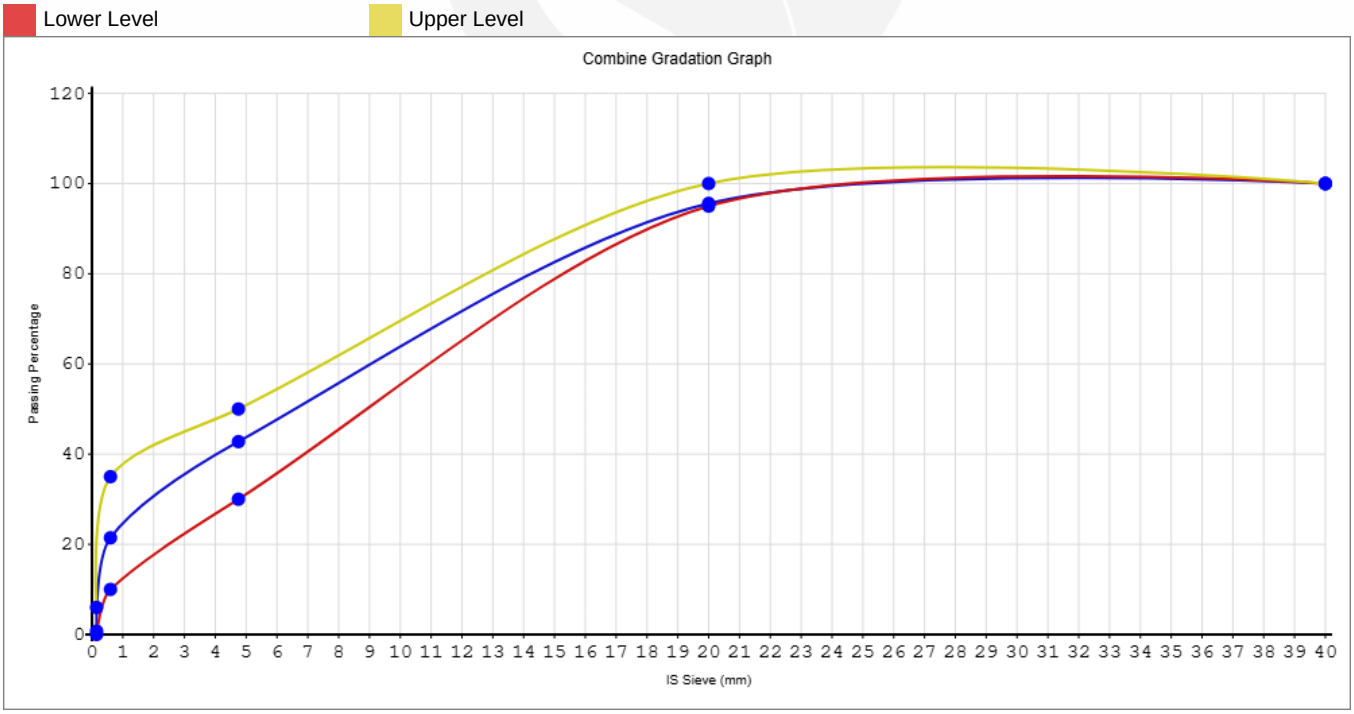
TYPE OF AGGREGATE : 10 mm

IS SIEVE DESIGNATION (mm)	Percentage Retain Weight	Percentage Cumulative Retain Weight	Percentage Cumulative Passing Weight	Requirement of % Passing As Per IS 383 , Table No-7 for Single Size Agg.
12.5	13.6	13.6	86.4	100
10	26.6	40.2	59.8	85 - 100
4.75	48.4	88.6	11.4	0 - 20
2.36	8.5	97.1	2.9	0 - 5

ALL IN AGGREGATE GRADING

IS Sieve DESIGNATION	Percentage passing and proportion of aggregates			As per table 10 of IS 383, percentage passing for All in aggregate grading (20 mm nominal size)
	20 mm	10 mm	River Sand	
	29.2%	31.5%	39.3%	
40	100			100
20	95.6			95 - 100
4.75	42.8			30 - 50
0.6	21.4			10 - 35
0.15	0.7			0 - 6

ALL IN AGGREGATE GRAPH



TEST REPORT NO. : BNR-1127-TR-790403

3. TARGET MEAN STRENGTH

a) fck'=fck+1.65S: 26.6 N/mm^2

where fck =20 N/mm^2 and Standard deviation as per Table no. 2 clause no. 4.2.1.3 of IS 10262 for the grade of concrete M-20 (S) =4.

b) fck'=fck+X : =25.5 N/mm^2

where fck =20 N/mm^2 and value of X as per Table no. 1 clause no. 4.2.1.3 of IS 10262 for the grade of concrete M-20 (S) =5.5

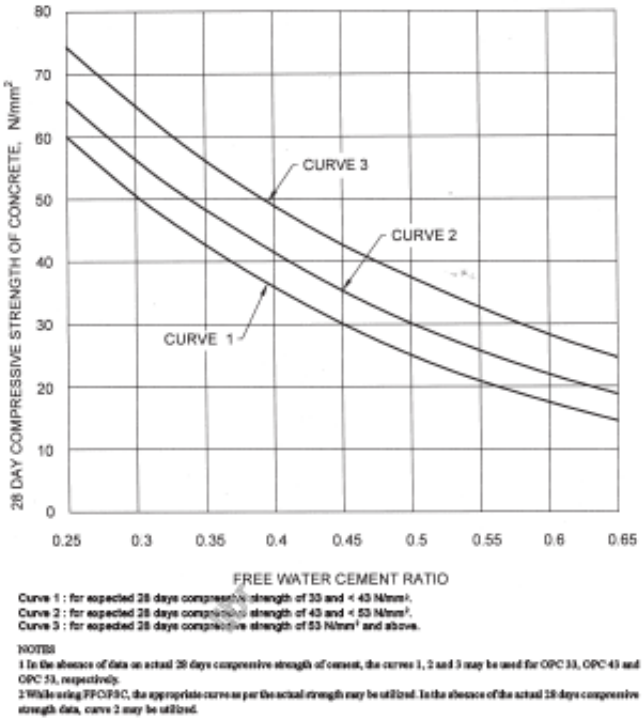
The higher value is to be adopted. Therefore, target strength will be 26.6 N/mm^2 is higer than 25.5 N/mm^2

4. AIR CONTENT: As Per Clause No 5.2 Table No. 3 of IS 10262 for Max Aggregate Size 20 mm & grade of concrete M-20 is 1%.

Volume of air content= 0.01 cum

5. SELECTION OF WATER CEMENT RATIO (based on trial experience & also referred figure-1 of IS 10262:2019 & table-5 of IS 456:2000):

Sr No	Adopted Water Cement Ratio (W/c)	Revised W/c
1	0.48	0.48



Curve 1 : for expected 28 days compressive strength of 33 and < 43 N/mm².
Curve 2 : for expected 28 days compressive strength of 43 and < 53 N/mm².
Curve 3 : for expected 28 days compressive strength of 53 N/mm² and above.

NOTES

1 In the absence of data on actual 28 days compressive strength of cement, the curves 1, 2 and 3 may be used for OPC 33, OPC 43 and OPC 53, respectively.

2 While using PPC/PSC, the appropriate curve as per the actual strength may be utilized. In the absence of the actual 28 days compressive strength data, curve 2 may be utilized.

FIG 1. RELATIONSHIP BETWEEN FREE WATER CEMENT RATIO AND 28 DAYS COMPRESSIVE STRENGTHS OF CONCRETE FOR CEMENTS OF VARIOUS EXPECTED 28 DAYS COMPRESSIVE STRENGTHS

6. ESTIMATION OF WATER CONTENT:As Per Clause No 5.3 Table No 4 of IS 10262:

6.1: For 50 mm slump using maximum aggregate size 20 mm and texture of aggregate Angular =186 kg

6.2: Addition of water for workability requirement @ 3% for each 25mm workability above 50 mm workability = 24.6 kg

6.3: Subtraction of water using PC base of plasticizer @ 24.6%=51.8 kg.

6.4: Water content (Free Water) =159 kg

7. CALCULATION OF CEMENT CONTENT:

7.1: Adopted Water Cement Ratio (W/c)=0.48

7.2 Cement Content= 331 kg/m^3

7.2a: Revised Water-Cement Ratio =0.48

7.3: Volume of cement used = 0.106 cum

TEST REPORT NO. : BNR-1127-TR-790403

8. ESTIMATION OF COARSE AGGREGATE AND FINE AGGREGATE CONTENT:
8.1: Calculation of Volume of Total Aggregate= 0.723 cum.
8.2: Estimation of Coarse Aggregate Content:
8.2.a: For w/c ratio 0.5 and Max Aggregate Size 20 mm and fine aggregate used of zone 2 as per Table No 5 of IS 10262 =0.62 * Volume of total aggregate.
8.2.b: Addition of coarse aggregate as per clause no 5.5.1 of IS 10262 for revised water cement Ratio (0.48)= 0.004 * Volume of total aggregate.
8.2.c: Reduction of coarse aggregate as per clause no 5.5.2 of IS 10262 for pumpable mix @ 0% = 0 * Volume of total aggregate.

8.2.d: Reduction of Coarse Aggregate for congested reinforcing steel to get desired workability as per clause no 5.5.2 of IS 10262 = 0.04.
8.2.d.1:Volume of coarse aggregate per unit volume of Total Aggregate = 0.584.
8.2.e: Final Volume of coarse aggregate per unit volume of concrete = 0.422 cum.
8.2.1: Volume of 20 mm coarse aggregate used 48% volume of total coarse aggregate =0.203 cum.
20 mm coarse aggregate content =587 kg.
8.2.2: Volume of 10 mm coarse aggregate used 52% volume of total coarse aggregate =0.219cum.
10 mm coarse aggregate content =633 kg.
8.3: Calculation for Volume of Fine Aggregate Content: 0.301 cum.
8.3.a: Volume of Natural sand used 41.6 % volume of total aggregate: 0.301 cum.
8.3.b: Natural sand aggregate content: 789 kg.

9. Mix Calculation:
a) Total Volume of concrete: 1 cum.
b) Volume of Entrapped Air: 0.01 cum.
c) Volume of Cement: 0.106 cum.
d) Volume of Water: 0.159 cum.
e) Volume of Chemical Admixture: 0.002 cum.
f) Volume of Total Aggregate: 0.723 cum.
g) Mass of Coarse Aggregate: 1220 kg.
h) Mass of Fine Aggregate : 789 kg.

9.1 CONCRETE MIX PROPORTION USING SSD CONDITION AGGREGATE

Sr No	Ingredients	Material in kg/cum	Percentage proportion of aggregates in SSD condition	Material in kg/Cement bag	Material in Vol (L) / Cement bag	Aggregate by Farma of 35L Cap/ Cement Bag
1	Cement OPC-53	331	-	-		
2	SSD 20 mm	587	29.2	89	57	1.6
3	SSD 10 mm	633	31.5	96	62	1.8
4	SSD River Sand	789	39.3	119	77	2.2
5	Free Water	159	-	24	24	
6	Admixture	2.6	0.8% by weight of cement / cementitious content	0.4	0.37	

NOTE - Aggregates shall be used in saturated surface dry condition. If otherwise, when computing the requirement of mixing water, allowance shall be made for the free (surface) moisture contributed by the fine and coarse aggregates. On the other hand, if the aggregates are dry, the amount of mixing water shall be increased by an amount equal to the moisture likely to be absorbed by the aggregates. Necessary adjustments are also required to be made in mass of aggregates.

10.CONCRETE MIX PROPORTION USING DRY CONDITION AGGREGATE

Sr No	Ingredients	Material in kg/cum	Percentage proportion of aggregates in DRY condition	Material in kg/Cement bag	Material in Vol (L) / Cement bag	Aggregate by Farma of 35L Cap/ Cement Bag
1	Cement OPC-53	331	-	-		
2	DRY 20 mm	586	29.3	89	57	1.6
3	DRY 10 mm	631	31.6	95	62	1.8

TEST REPORT NO. : BNR-1127-TR-790403

4	DRY River Sand	783	39.2	118	77	2.2
5	Total Water	168	-	25	25.4	
6	Admixture	2.6	0.8% by weight of cement / cementitious content	0.4	0.37	

CONCRETE MIX DESIGN CUBE COMPRESSION TEST RESULTS (ACT BY BOILING WATER METHOD AS PER IS 9013:1978)

CUBE SIZE(mm): 150X150X150 **DATE OF CASTING: 07-07-2025**

AGE OF SPECIMEN(DAYS):1 **DATE OF TESTING : 08-07-2025**

Sr. No	Dimension of specimen, mm			Cross sectional area mm^2	Weight, kg	Accelerated Crushing Load, kN	Accelerated Compressive Strength MPa, (Ra)	Equi. 28 Days Comp., (R28=8.09 + 1.64 Ra) Strength, MPa	Type of Failure occurred as per IS 516 Part-1 Sec-1
	Length	Width	Thickness						
1	150.8	151.3	151.1	22812	8.510	255	11	26	Usual
2	151	150.5	150.7	22713	8.360	236	10.5	25.5	Usual
3	150.4	150.6	150.4	22654	8.461	234	10.5	25.5	Usual
					Average Value =		10.5	25.5	

DATE OF CASTING:07-07-2025 DATE OF TESTING:04-08-2025

AGE OF SPECIMEN (Days):28

Sr. No	Dimension of specimen, mm			Cross sectional area mm^2	Weight, kg	Maximum Load, kN	Compressive Strength, MPa	Type of Failure occurred as per IS 516 Part-1 Sec-1
	Length	Width	Thickness					
1	150.7	150.6	150.4	22692	8.465	693.8	30.5	Usual
2	150.5	150.6	150.6	22669	8.407	668.7	29.5	Usual
3	150.4	150.5	150.2	22628	8.400	626.8	27.5	-
						Average Value =	29	

Remark:

Test Witnessed: Dr. Aneeya Kumar Samantara (Senior Scientist)

NOTE:

-Mix will require necessary moisture correction of water at site depending on the condition of aggregate (see clause No. 10.2.5 of IS 456:2016)

-As per Clause No.10.2 of IS 456: 2016, Water shall be weighed or measured by volume in a calibrated tank for batching of concrete (see also IS 4925)

-Mix will require necessary bulkage correction for fine aggregate if volumetric batching.

-As per Clause No.9.2.3 of IS 456: 2016, Mix design done earlier not prior to one year may be considered adequate for later work provided there is no change in source and the quality of the materials.

-Dosage of Admixture is varied (+/- 0.2%) as per the working conditions, environmental conditions (temperature & humidity) and desired workability within the manufacturer recommendations. Performance of admixture shall be checked periodically at site

-The bulk density and specific gravity of materials to be used shall be confirmed by testing of such materials from time to time. If any deviations in the above parameters are observed, suitable corrections for proportions shall be applied at site.

-The coarse and fine aggregate used shall conform to the requirements given in IS 383:2016. The gradation shall be same as that used in the design mix.

-This Certificate valid only to the sample submitted for testing

-Any Correction or changes invalid this Certificate

-- The authenticity of this report can be verified by scan QR Code to know your Report mentioned below.

**********End of Report**********

H. JOSHI
(Quality Manager)

Authorized Signatory

SCAN HERE TO KNOW YOUR REPORT

Branch Office: Global Lab, Plot No- 206, Mahadev Nagar, Jharpada Road, Jharapada, Khordha, Bhubaneswar, Odisha- 751006

VASAI | NAVI MUMBAI | BORIVALI | KURLA | SURAT | AHMEDABAD | KOLKATA | BHUBANESHWAR | GUWAHATI