



LANDMARK

Material Testing And Research Laboratory Pvt. Ltd.

Doc No.-QR/08

Rev. No.-00

Date: 31.05.2018

LRL\02\2018-19\04N-1

TEST REPORT

1. Name & Address of Customer : **Paharia Minerals**
2. Material Identification : Aggregate: 20mm-(2Bags), 10mm-(2Bags), M-Sand- (2Bags),
Cement: Wonder PPC (1Bag), Admixture: - BS Futura PCX 107
3. Sample Condition when Received : OK.
4. SRF /Letter Reference : SRF Dated 04.04.2018
5. Source/ Location : -
6. Date of Sample Receipt : 04.04.2018 & 01.05.2018
7. Date of Sample Tested : 05.04.2018 To 31.05.2018
8. Environmental Conditions : As per IS Code

TEST RESULT

1. STIPULATIONS FOR CONCRETE MIX PROPORTIONING.

S. No.	Description	Value	Unit	Relevant IS Codes
(a)	Concrete Grade	M -25	-	IS-456: 2000, Table 5
(b)	Type of Cement	PPC	-	IS-1489 (Part-1):1991
(c)	Brand	Wonder	-	-
(d)	Type of Aggregate	Crushed Angular	-	IS-383:2016
(e)	Maximum Nominal Size of Aggregate	20	mm	IS-456: 2000, Table 6
(f)	Minimum Cement Content	300	kg/m ³	IS: 456:2000, Table 5
(g)	Maximum W/C Ratio	0.50	-	IS: 456:2000, Table 5
(h)	Exposure Condition	Moderate	-	IS-456: 2000, Table 3
(i)	Degree of Workability	Low	-	IS-456: 2000 Clause 7.1

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Regd Office : G-200, RIICO Industrial Area, Mansarovar, Jaipur (Raj)-302020

+91 141 2401478, 4022067, 9414297329, lrljpr@gmail.com, lrlptjpr@gmail.com, www.lrlilabs.com
CIN No. U73100RJ2011PTC034607, PAN No. AABCL9797K, GST No. 08AABCL9797K1Z1N

2. PHYSICAL PROPERTIES OF CEMENT

S. No.	Description	Value	Unit	Method of Test
1	Specific Gravity	2.86	-	IS-4031 (Part-11), 1988
2	Consistency	31.0	%	IS-4031 (Part-4), 1988
3	Initial Setting Time	160	minutes	IS-4031 (Part-5), 1988
4	Final Setting Time	215	minutes	
5	Compressive Strength (i) 72 ± 1 hours (3-days) (ii) 168 ± 2 hours (7-days) (iii) 672 ± 4 hours (28-days)	26.0 38.5 51.0	N/mm ² N/mm ² N/mm ²	IS- 4031(Part-6), 1988

3. PHYSICAL PROPERTIES OF AGGREGATES (COARSE / FINE)

S. No.	Parameters	20mm	10mm	M - Sand	Method of Test
(a)	Specific Gravity	2.69	2.69	2.62	IS:2386 (Part-III)-1963
(b)	Impact Value (%)	20	-	-	IS:2386 (Part-IV)-1963
(c)	Abrasion Value (%)	25.0	-	-	IS:2386 (Part-IV)-1963
(d)	Bulk Density (Loose), kg/l	1.26	1.23	1.57	IS:2386 (Part-III)-1963
(e)	Bulk Density (Compacted), kg/l	1.35	1.35	1.66	IS:2386 (Part-III)-1963
(f)	Water Absorption (%)	0.20	0.36	0.46	IS:2386 (Part-III)-1963

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4. GRADATION

(a) Sieve Analysis of Fine Aggregate (M-Sand).

IS Sieve Designation	Cumulative % Retained	Cumulative % Passing	Cumulative % Finer as per IS: 383 Zone – II	Remarks		Method of Test
10 mm	0.00	100	100	Fineness Modulus	2.71	IS:383-2016
4.75 mm	1.20	98.80	90-100			
2.36 mm	10.13	89.87	75-100			
1.18 mm	37.73	62.27	55-90	Silt Content %	0.8	
600 μ	48.53	51.47	35-59			
300 μ	79.06	20.94	8-30			
150 μ	94.39	5.61	0-10			

(b) Combined Sieve Analysis of Coarse Aggregate

IS Sieve Designation	Aggregate Fraction % Finer		% of Different Fractions				Requirement for Graded Aggregate as per IS 383: 2016
	20mm	10mm	20mm (55.0 %)	10mm (45.0 %)	Combined (100%)		
40mm	100	100	55.00	45.00	100	100	
20mm	93.20	100	51.26	45.00	96.26	90-100	
10mm	4.26	99.90	2.34	44.96	47.30	25-55	
4.75 mm	0.18	12.65	0.10	5.69	5.79	0-10	

Recommendation: - Nominal size of aggregate shall be produced at site by mixing of different size of aggregates according to IS:383 Table No. 2 specifications.

(c) All in Aggregate Gradation

IS Sieve Designation	Aggregate Fraction % Finer			% of Different Fractions				Requirement for all in Aggregate as per IS:383
	20mm	10mm	FA	20mm (34.0%)	10mm (28.0%)	FA (38.0%)	Combined (100%)	
40mm	100	100	100	34.00	28.00	38.00	100	100
20mm	93.20	100	100	31.69	28.00	38.00	97.69	95-100
4.75mm	0.18	12.65	98.80	0.06	3.54	37.54	41.14	30-50
600μ	-	-	51.47	-	-	19.56	19.56	10-35
150μ	-	-	5.61	-	-	2.13	2.13	0-6

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8. MIX PROPORTION BY WEIGHT FOR PER CUBIC METER CONCRETE (IS:10262-2009)

Water	Cement	Fine Aggregate	Coarse Aggregate by wt. for Different Fraction %		Total Coarse Aggregate
			20 mm (55.0%)	10 mm (45.0%)	
(kg/m ³)	(kg/m ³)	(kg/m ³)	(kg/m ³)	(kg/m ³)	(kg/m ³)
173.0	368.0	691.0	637.0	522.0	1159.0
0.47	1.0	1.878	-	-	3.149

9. MIX PROPORTIONS BASED ON AGGREGATE IN DRY CONDITION

Corresponding to the design strength of concrete mix the following quantities are obtained after lab trials conducted as per standard guidelines.

(i) Water	179.0	kg/m ³
(ii) Cement	368.0	kg/m ³
(iii) Fine Aggregate Content	688.0	kg/m ³
Total Coarse Aggregate Content	1156.0	
(iv) 20mm (55%)	636.0	kg/m ³
10mm (45%)	520.0	
(v) Chemical Admixture @ 0.90%	3.31	kg/m ³
(vi) Slump	35-50	mm

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10. COMPRESSIVE STRENGTH OF DESIGNED MIX - CUBE TEST RESULTS

Six cubes of Designed Mix Concrete with its contents by weight were cast and tested for 7 & 28 days Compressive Strength. The results are tabulated below (7 Days)

ID Mark	Average Sectional Dimensions (mm × mm)	Cross Sectional Area (mm ²)	Date of Casting	Date of Testing	Max. Load (N)	Comp. Strength (N/mm ²)	Avg. Compressive Strength		Weights (g)	Method of Test
							N/mm ²	kg/cm ²		
1	150.00×150.00	22500.00	03.05.18	10.05.18	558.0 × 10 ³	24.8	25.1	251	8120	IS:516-1959
2	150.00×150.00	22500.00	03.05.18	10.05.18	571.2 × 10 ³	25.4			8145	
3	150.00×150.00	22500.00	03.05.18	10.05.18	565.0 × 10 ³	25.1			8105	

Compressive Strength (28 Days)

ID Mark	Average Sectional Dimensions (mm × mm)	Cross Sectional Area (mm ²)	Date of Casting	Date of Testing	Max. Load (N)	Comp. Strength (N/mm ²)	Avg. Compressive Strength		Weights (g)	Method of Test
							N/mm ²	kg/cm ²		
1	150.00×150.00	22500.00	03.05.18	31.05.18	905.2 × 10 ³	40.2	40.7	407	8168	IS:516-1959
2	150.00×150.00	22500.00	03.05.18	31.05.18	900.0 × 10 ³	40.0			8190	
3	150.02×150.02	22506.00	03.05.18	31.05.18	940.3 × 10 ³	41.8			8178	

- The slump has been measured immediately after mixing.
- The mix design was conducted under control conditions for the sample supplied to us. It is advised to conduct the quality control tests on site at regular intervals.
- The aggregate used in Mix Design is in dry condition.

CONCLUSION

The given materials when mixed in proportion (by weight) of **1 Cement: 1.878 Fine Aggregate (Crusher Stone Dust): 3.149 Coarse Aggregate with a W/C Ratio of 0.47** will be able to produce a concrete of desired characteristic compressive strength of 25 N/mm² (M-25) required in field after 28 days within the design stipulations provided by the customer. The Admixture **BS Futura PCX 107** with the dosing of **0.90%** by weight of cement (**450g per 50Kg**) has been used in the mix design.

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