5. CONCLUSION AND RECOMMENDATION

Based on the results obtained with respect to above mentioned objectives, following conclusions can be made.

- UPV and compressive strength of cement mortar has a linear relationship and LSF also has an indirect influence on this relationship.
- UPV at 02 day increases about 24% at the end of 28 days if following factors kept constant;
    - i. Water/cement ratio
    - ii. Amount and size of aggregates
    - iii. Curing media (i.e. water)
    - iv. Curing temperature (i.e. $27 \pm 1\ ^0C$)
- Correlations given in (3) and (4) can be used to predict compressive strength of cement at 28 days within 02 days with only ± 5% deviation.

Results of this study can be used to expedite the testing of OPC at laboratory scale and hence will be beneficial for import inspection scheme operated by SLSI.

However, since LSF of the cement samples used for this study lie between 0.90-1.00 and throughout the entire experiment the temperature was maintained at $27 \pm 1\ ^0C$, the correlations can be recommended for the samples which have LSF of the same range and a stable temperature condition. For samples having LSF out of the above range and for varying temperature conditions further studies have to be carried out.

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APPENDIX – A: INDIVIDUAL RESULTS, MEAN VALUE AND STANDARD DEVIATION OF UPV AND COMPRESSIVE STRENGTH OF 10 SAMPLES (30 SPECIMENS) OF CEMENT MORTAR.

Sample ID	Age	UPV m/s					Compressive strength MPa				
		Specimen no.			Mean	Stdev	Specimen no.			Mean	Stdev
		i	ii	iii			i	ii	iii		
A	02	4259.22	4236.97	4238.43	4244.87	12.44	18.72	19.82	18.93	18.96	0.72
							18.84	19.64	17.81		
	07	4453.3	4440.45	4447.89	4447.21	6.45	28.41	28.74	30.81	29.64	1.08
							29.2	29.64	31.05		
	15	4786.38	4780.00	4795.18	4787.19	7.62	31.43	40.42	36.18	36.2	3.04
							34.46	37.26	37.45		
	28	5248.9	5266.57	5282.13	5265.87	16.62	46.36	42.22	46.15	44.55	3.05
							41.9	41.68	49.01		
B	02	4195.8	4195.8	4225.35	4205.65	17.06	18.75	19.1	19.44	19.27	0.29
							19.5	19.41	19.41		
	07	4483.15	4516.98	4484.96	4495.03	19.03	31.51	30.73	30.95	31.22	0.31
							31.41	31.39	31.33		
	15	4819.28	4826.61	4792.00	4812.63	18.24	37.68	37.76	38.06	37.96	0.34
							37.56	38.33	38.38		
	28	5226.09	5172.41	5186.15	5194.88	27.88	50.58	49.69	48.83	49.95	0.63
							50.14	50.08	50.39		
C	02	4109.56	4137.93	4109.59	4119.04	16.36	22.03	21.60	20.91	21.71	0.62
							21.94	21.18	22.63		
	07	4411.76	4363.64	4428.04	4401.15	33.49	31.63	31.85	32.58	32.24	0.46
							32.79	32.08	32.5		
	15	4651.16	4669.26	4687.5	4669.31	18.17	37.68	37.76	38.06	37.96	0.34
							37.56	38.33	38.38		
	28	5111.11	5067.8	5016.27	5085.06	22.96	54.19	53.20	54.30	53.27	0.8
							52.89	52.58	52.49		
D	02	4255.32	4255.32	4240.28	4250.31	8.68	16.62	22.18	17.64	18.60	2.42
							18.91	20.47	15.78		
	07	4545.45	4535.85	4601.53	4560.95	35.48	27.46	28.54	28.74	29.12	1.15
							29.53	30.84	29.61		
	15	4822.58	4889.80	4909.84	4874.07	45.70	33.06	33.29	36.73	34.91	1.74
							34.69	34.44	37.24		
	28	5324.44	5244.54	5290.75	5286.58	40.11	50.35	49.09	48.39	48.73	1.08
							47.63	47.54	49.34		
E	02	4181.18	4210.53	4210.53	4200.75	16.94	19.12	24.68	20.14	21.21	2.28
							21.41	22.97	18.91		
	07	4460.97	4477.61	4428.04	4455.54	25.23	33.71	34.79	34.99	34.43	1.65
							35.78	31.46	35.86		
	15	4938.27	4942.39	4958.68	4946.45	10.79	45.56	45.79	49.23	45.95	2.78
							40.94	46.94	47.24		
	28	5186.15	5222.71	5222.71	5210.52	21.11	53.48	54.71	54.02	53.14	2.16
							50.26	50.76	55.59		

Cont.

Sample ID	Age	UPV m/s					Compressive strength MPa				
		Specimen no.			Mean	Stdev	Specimen no.			Mean	Stdev
		i	ii	iii			i	ii	iii		
F	02	4026.85	4040.40	4013.38	4026.88	13.51	21.41	20.56	19.53	20.37	0.68
							20.70	19.78	20.26		
	07	4293.91	4263.35	4297.49	4284.91	18.77	31.01	31.03	32.26	31.51	0.64
							32.17	30.83	31.79		
	15	4651.16	4633.20	4633.20	4639.19	10.37	40.81	40.89	41.81	40.25	1.31
							40.69	38.33	39.00		
	28	4991.67	4987.50	4991.67	4990.28	2.41	51.31	49.39	51.34	50.53	1.80
							49.01	53.39	48.77		
G	02	4152.25	4166.67	4152.25	4157.05	8.32	23.45	22.86	22.48	22.79	0.44
							22.58	23.13	22.28		
	07	4411.76	4411.76	4428.04	4417.19	9.4	32.88	33.10	33.83	33.49	0.46
							34.04	33.33	33.75		
	15	4780.88	4800.00	4780.88	4787.25	11.4	41.83	41.67	42.20	41.64	0.74
							40.81	40.76	42.59		
	28	5172.41	5150.21	5172.41	5165.01	12.82	53.61	53.68	51.66	54.28	1.64
							54.98	56.16	55.61		
H	02	4155.71	4152.25	4166.67	4158.21	7.53	17.57	19.50	18.04	18.54	0.69
							18.66	18.47	19.01		
	07	4404.41	4433.33	4397.06	4411.60	19.18	31.63	31.85	31.96	31.20	0.7
							30.29	30.83	30.63		
	15	4842.11	4746.03	4788.00	4792.05	48.16	40.81	41.67	42.20	41.64	0.74
							41.83	40.76	42.59		
	28	5163.79	5137.34	5181.82	5160.98	22.37	46.93	49.08	49.29	48.09	1.49
							49.60	45.86	47.79		
I	02	4271.43	4257.14	4278.57	4269.05	10.91	21.88	19.69	20.96	20.37	0.99
							20.75	19.31	19.63		
	07	4513.21	4576.34	4507.52	4532.35	38.2	31.38	29.94	31.02	30.86	0.6
							31.05	31.46	30.33		
	15	4815.26	4826.61	4807.23	4816.37	9.74	40.66	41.39	39.67	41.31	1.05
							41.44	42.71	41.96		
	28	5305.31	5268.72	5281.94	5285.32	18.53	51.76	52.00	50.54	51.69	1.29
							53.46	49.91	52.47		
J	02	4218.31	4233.22	4195.80	4215.78	18.83	22.31	21.60	23.65	22.84	0.85
							23.26	22.47	23.76		
	07	4444.44	4477.61	4460.97	4461.01	16.58	33.88	33.42	33.16	33.46	0.44
							33.38	34.06	32.88		
	15	4743.08	4743.08	4761.90	4749.36	10.87	45.75	43.89	46.29	45.06	1.15
							43.94	46.24	44.26		
	28	5181.82	5204.35	5231.44	5205.87	24.85	53.16	52.13	53.34	52.97	0.65
							52.19	53.70	53.30		