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Appendix

This list below describes the appendices to this thesis

Table 12: Flowability and Foaming dosage of FC admixed with CD-RFA

Sample ID	Dilution ratio (1:20)		Dilution ratio (1:40)		Dilution ratio (1:60)	
	Foaming dosage (gm)	Flowability (mm)	Foaming dosage (gm)	Slump flow (mm)	Foaming dosage (gm)	Slump flow (mm)
Control mix	200	502.5	200	470	250	460
10 % CD-RFA	300	477.5	210	395	350	415
30 % CD-RFA	400	365	280	402.5	410	402.5
50 % CD- RFA	420	310	400	242.5	450	315
70 % CD-RFA	480	237.5	600	265	700	265
100 % CD-RFA	650	350	700	267.5	1000	300

Table 13: Flowability and Foaming dosage of FC admixed with CWTP

Sample ID	Dilution ratio (1:20)		Dilution ratio (1:40)		Dilution ratio (1:60)	
	Foaming dosage (gm)	Flowability (mm)	Foaming dosage (gm)	Slump flow (mm)	Foaming dosage (gm)	Slump flow (mm)
Control mix	200	502.5	200	470	250	460
10% CWTP	240	347.5	250	337.5	400	440
30% CWTP	300	307.5	325	432.5	450	425
50% CWTP	330	427.5	480	360	500	360
70% CWTP	480	342.5	550	375	700	342.5
90% CWTP	650	225	750	212	800	300

Table 14: Density of FC mixes admixed with CD-RFA

Dilution Ratio	Sample ID	Fresh density (kg/m ³)	Dry density (kg/m ³)	Bulk density (SSD) (kg/m ³)	Apparent density (kg/m ³)	Standard Deviation		
						Dry density	Bulk density (SSD)	Apparent density
Dilution ratio (1:20)	Control mix	1798.00	1618.45	1802.49	1965.14	88.91	84.81	96.87
	10% CD-RFA	1745.00	1676.47	1865.97	2048.51	36.52	36.85	44.39
	30% CD-RFA	1698.00	1584.93	1778.76	1949.59	47.08	52.76	70.58
	50% CD- RFA	1733.00	1642.84	1849.08	2049.63	17.42	18.47	24.36
	70% CD-RFA	1702.00	1592.90	1826.90	2059.58	9.93	15.89	28.13
	100% CD-RFA	1498.00	1345.37	1580.87	1748.03	43.82	45.74	60.12
Dilution ratio (1:40)	Control mix	1768.00	1647.84	1811.89	1953.50	37.17	35.00	38.17
	10% CD-RFA	1853.00	1669.65	1852.16	2022.81	71.69	71.99	85.85
	30% CD-RFA	1793.00	1682.68	1868.90	2048.02	30.02	33.49	44.44
	50% CD- RFA	1752.00	1583.70	1784.12	1963.40	7.22	10.19	16.04
	70% CD-RFA	1640.00	1552.19	1760.94	1945.16	11.36	16.39	30.33
	100% CD-RFA	1514.00	1375.59	1605.95	1774.94	36.94	39.56	52.59
Dilution ratio (1:60)	Control mix	1895.00	1792.78	1961.63	2135.06	35.03	39.53	52.58
	10% CD-RFA	1742.00	1677.29	1867.82	2051.90	74.98	77.05	94.85
	30% CD-RFA	1728.00	1660.28	1867.16	2073.06	36.50	37.92	48.24
	50% CD- RFA	1665.00	1563.89	1774.47	1963.67	20.15	14.58	11.52
	70% CD-RFA	1764.00	1606.27	1829.17	2047.44	32.08	33.80	44.27
	100% CD-RFA	1534.00	1385.01	1619.79	1796.73	36.59	35.30	43.47

Table 15: Density of FC mixes admixed with CWTP

Dilution Ratio	Sample ID	Fresh density (kg/m ³)	Dry density (kg/m ³)	Bulk density (SSD) (kg/m ³)	Apparent density (kg/m ³)	Standard Deviation		
						Dry density	Bulk density (SSD)	Apparent density
Dilution ratio (1:20)	Control mix	1798.00	1618.45	1847.36	1965.14	88.91	84.21	96.87
	10% CWTP	1805.00	1731.10	1914.10	2098.17	31.48	31.87	39.17
	30% CWTP	1801.00	1677.42	1866.89	2049.20	23.60	24.08	30.51
	50% CWTP	1701.00	1546.65	1741.20	1904.40	28.36	31.92	43.35
	70% CWTP	1705.00	1581.51	1778.02	1950.71	11.15	10.64	12.77
Dilution ratio (1:40)	Control mix	1768.00	1647.84	1811.89	1953.50	37.17	34.60	38.17
	10% CWTP	1850.00	1735.72	1916.68	2097.86	16.08	15.26	19.01
	30% CWTP	1798.00	1612.69	1822.07	2021.10	17.60	18.34	24.00
	50% CWTP	1796.00	1672.97	1874.18	2073.71	4.75	3.94	4.29
	70% CWTP	1660.00	1595.78	1817.51	2030.76	53.64	55.99	74.63
Dilution ratio (1:60)	Control mix	1895.00	1792.78	1961.63	2135.06	35.03	39.22	52.58
	10% CWTP	1850.00	1744.37	1949.15	2170.63	32.02	35.51	49.36
	30% CWTP	1785.00	1655.92	1855.35	2048.20	22.21	19.07	20.20
	50% CWTP	1735.00	1589.11	1794.24	1982.02	16.65	18.04	24.47
	70% CWTP	1682.00	1516.37	1715.09	1877.68	12.40	14.48	20.27

Table 16: Hardened properties of FC mixes admixed with CD-RFA

Dilution Ratio	Sample ID	Volume of permeable voids, %	Porosity, %	water Absorption, %	Standard Deviation		
					Volume of permeable voids	Porosity	Water Absorption
Dilution ratio (1:20)	Control mix	18.75	16.99	10.52	0.51	0.60	0.39
	10% CD-RFA	22.25	20.07	13.32	0.28	0.19	0.09
	30% CD-RFA	18.83	17.93	10.79	2.59	2.71	1.93
	50% CD- RFA	31.08	20.58	12.03	8.07	0.57	1.74
	70% CD-RFA	25.65	20.69	13.96	7.91	6.27	4.36
	100% CD-RFA	26.27	23.99	18.19	1.27	1.44	0.76
Dilution ratio (1:40)	Control mix	22.76	22.58	12.77	0.74	0.77	0.63
	10% CD-RFA	21.46	20.89	12.96	0.18	0.27	0.22
	30% CD-RFA	32.24	24.07	15.88	4.30	1.45	0.61
	50% CD- RFA	21.61	19.40	11.78	0.21	1.37	1.13
	70% CD-RFA	26.98	23.86	15.42	2.01	0.25	0.31
	100% CD-RFA	31.74	27.33	18.37	2.20	1.15	0.51
Dilution ratio (1:60)	Control mix	15.89	15.20	8.64	1.88	1.80	1.11
	10% CD-RFA	18.72	17.11	9.74	1.18	1.33	0.67
	30% CD-RFA	19.01	18.47	10.71	1.90	1.70	1.16
	50% CD- RFA	25.76	23.71	15.02	0.46	0.42	0.12
	70% CD-RFA	25.65	24.36	15.83	0.32	0.95	1.13
	100% CD-RFA	29.18	26.99	17.61	0.42	0.13	0.13

Table 17: Sorptivity data of FC mixes admixed with CD-RFA at dilution ratio of 1:20

Time (Sec ^{1/2})	Sorptivity (I)					
	Control mix	10% CD-RFA	30% CD-RFA	50% CD- RFA	70% CD-RFA	100% CD-RFA
0	0	0	0	0	0	0
7.74597	0.89689	0.84485	1.08055	1.25809	0.92138	1.30095
17.3205	1.48767	1.12953	1.61011	2.20089	1.33156	1.67133
24.4949	1.73561	1.40502	2.08763	2.82229	1.54889	1.96519
34.641	2.20395	1.73867	2.64168	3.16512	1.94989	2.5621
42.4264	2.507	1.99886	3.17124	3.84468	2.33252	3.0335
60	3.03962	2.43965	4.02528	4.45382	3.77733	3.93651
84.8528	3.66407	2.95391	4.82727	6.05781	4.04364	4.74156
103.923	4.08344	3.29981	5.60172	6.28433	4.37118	5.71804
120	4.3773	3.66713	5.81599	6.46493	4.62218	6.12516
134.164	4.72932	4.09568	6.0272	6.68533	5.35071	6.63941
146.969	5.03848	4.4324	6.37004	6.90878	5.72722	7.09857
303.677	6.03638	6.39453	6.5935	7.26693	6.4833	7.83934
439.545	6.35779	6.57513	6.79246	7.38937	6.66084	8.17912
518.17	6.54758	6.73736	6.97307	7.50263	6.84144	8.3536
657.267	6.81389	6.91491	7.13224	7.67711	7.06184	8.5893
726.347	7.18122	7.23019	7.27917	7.8822	7.32815	8.84949
788.797	7.43834	7.51793	7.53324	8.173	7.6618	8.98723
831.384	7.70772	7.84852	7.75975	8.39339	8.16075	9.16171
881.816	7.92199	8.12402	7.98627	8.69031	8.48522	9.28722
929.516	8.2985	8.40564	8.24952	8.91071	8.9505	9.39741

Table 18: Sorptivity data of FC mixes admixed with CD-RFA at dilution ratio of 1:40

Time (Sec ^{1/2})	Sorptivity (I)					
	Control mix	10% CD-RFA	30% CD-RFA	50% CD- RFA	70% CD-RFA	100% CD-RFA
0	0	0	0	0	0	0
7.74597	0.78363	0.82342	0.45916	0.79281	0.98872	1.34992
17.3205	1.43563	1.2887	1.9254	1.7601	1.5642	2.37843
24.4949	1.75704	1.71113	2.62332	2.11212	2.01111	2.90799
34.641	1.95601	1.96213	3.00289	2.36007	2.33252	3.19573
42.4264	2.34782	2.22538	3.40388	2.83147	2.63862	3.86916
60	2.72739	2.73964	4.04058	3.26002	3.19573	4.45995
84.8528	3.75897	3.5753	5.06297	4.54565	4.2671	5.90476
103.923	3.94569	3.81406	5.265	4.87013	4.55484	6.16189
120	4.20588	4.17833	5.57111	5.33541	5.14562	6.48636
134.164	4.62218	4.57933	5.92619	5.89864	5.78844	6.85062
146.969	5.17317	4.97114	6.25984	6.35473	6.27209	7.22407
303.677	5.83436	5.49458	6.74349	6.85368	6.97	7.53324
439.545	5.98435	5.67518	6.86899	6.98837	7.21795	7.80873
518.17	6.33943	6.13434	7.45059	7.09551	7.34039	8.02607
657.267	6.4833	6.4435	7.76894	7.21489	7.4812	8.07504
726.347	6.73124	6.64247	8.07198	7.44447	7.67405	8.21891
788.797	6.93021	6.87817	8.21891	7.60976	7.86689	8.31686
831.384	7.0802	7.11387	8.28013	7.80567	8.08729	8.424
881.816	7.27917	7.32509	8.31686	7.96791	8.31074	8.55257
929.516	7.42304	7.49957	8.41482	8.07198	8.5342	8.6444

Table 19: Sorptivity data of FC mixes admixed with CD-RFA at dilution ratio of 1:60

Time (Sec ^{1/2})	Sorptivity (I)					
	Control mix	10% CD-RFA	30% CD-RFA	50% CD- RFA	70% CD-RFA	100% CD-RFA
0	0	0	0	0	0	0
7.74597	0.86322	0.84179	1.20605	1.44175	1.08973	1.30095
17.3205	1.47236	1.2887	1.58868	1.84581	1.80296	2.5774
24.4949	1.99274	1.705	1.87948	2.22538	2.44578	3.53551
34.641	2.14886	1.83357	2.41823	2.81616	2.63556	3.83549
42.4264	2.54373	2.08151	2.88963	3.3947	3.08247	4.45688
60	3.71917	3.20798	3.6702	4.17221	4.81809	6.38228
84.8528	3.93651	3.47429	4.3926	4.97114	4.95584	6.70063
103.923	4.15996	3.80182	4.7385	5.82211	5.31704	6.94245
120	4.42321	4.11099	5.23133	6.27209	5.79762	7.25774
134.164	4.8487	4.51811	5.74865	6.54758	6.31494	7.64343
146.969	5.22215	4.85176	6.4435	6.95776	6.76798	8.08116
303.677	5.85578	5.52825	7.1353	7.371	7.28529	8.41176
439.545	6.00577	5.81599	7.36488	7.54242	7.42916	8.51583
518.17	6.13434	6.12209	7.47202	7.69853	7.58221	8.66276
657.267	6.2476	6.47411	7.61282	7.79343	7.76282	8.83418
726.347	6.56288	6.91491	7.77506	8.03219	8.06892	9.14641
788.797	7.10469	7.22407	7.8271	8.42094	8.26789	9.35762
831.384	7.45671	7.63119	7.87914	8.58624	8.57705	9.71882
881.816	7.79955	7.94342	8.30156	8.86173	8.90459	10.0862
929.516	8.09953	8.27401	8.65358	9.03927	9.16171	10.2484

Table 20: Mechanical characteristics of FC mixes admixed with CD-RFA at different dilution ratio

Dilution Ratio	Sample ID	Compressive strength (MPa)			Split tensile strength (28 days) (MPa)	Flexural strength (28 days) (Mpa)	Standard Deviation				
		7 days	28 days	90 days			Compressive strength			Split tensile strength	Flexural strength
							7 days	28 days	90 days		
Dilution ratio (1:20)	Control mix	11.16	17.44	18.12	1.80	4.50	0.01	1.63	1.25	0.11	0.99
	10% CD-RFA	10.17	10.79	11.15	1.28	4.44	0.20	0.43	0.41	0.02	0.40
	30% CD-RFA	12.70	12.96	13.23	1.81	4.70	0.12	2.19	0.17	0.16	0.20
	50% CD- RFA	8.69	9.37	13.25	1.52	4.47	0.19	0.00	2.27	0.16	0.21
	70% CD-RFA	10.97	11.12	13.76	1.38	4.27	0.34	0.20	1.79	0.18	0.08
	100% CD-RFA	8.39	9.94	10.22	1.49	4.45	0.19	0.11	0.16	0.16	0.13
Dilution ratio (1:40)	Control mix	16.67	22.35	28.31	2.18	4.68	1.21	3.41	4.02	0.52	0.45
	10% CD-RFA	10.96	14.17	17.15	2.27	4.88	0.00	2.08	1.51	0.48	0.28
	30% CD-RFA	6.36	8.83	10.94	1.01	3.10	0.36	0.34	2.12	0.60	0.74
	50% CD- RFA	12.45	12.87	14.84	2.27	4.54	2.03	0.18	3.40	0.20	0.88
	70% CD-RFA	10.91	13.35	14.93	1.50	4.71	0.86	1.06	1.97	0.14	0.18
	100% CD-RFA	8.96	10.70	10.84	1.62	4.69	0.45	0.42	0.81	0.44	0.23
Dilution ratio (1:60)	Control mix	14.82	17.41	20.03	1.71	5.68	0.31	0.97	3.19	0.60	0.03
	10% CD-RFA	12.93	16.12	25.00	2.11	5.08	0.97	1.38	1.09	0.36	0.63
	30% CD-RFA	12.66	13.65	19.52	1.73	5.29	0.05	0.62	1.22	0.17	0.46
	50% CD- RFA	10.41	12.49	20.50	2.24	5.17	0.18	0.35	3.51	0.45	0.35
	70% CD-RFA	10.98	13.29	16.65	2.13	4.62	0.58	2.72	1.82	0.20	0.86
	100% CD-RFA	11.94	12.02	17.86	1.65	4.48	0.42	0.41	0.92	0.37	0.28

Table 21: Abrasion loss of FC mixes admixed with CD-RFA at different dilution ratio

Sample ID	Abrasion Loss (%)		
	Dilution ratio (1:20)	Dilution ratio (1:40)	Dilution ratio (1:60)
Control mix	19.46	15.96	11.68
10 % CD-RFA	20.12	18.43	11.82
30 % CD-RFA	16.71	27.99	13.16
50 % CD- RFA	21.08	19.35	15.23
70 % CD-RFA	22.34	20.65	16.42
100 % CD-RFA	31.34	21.80	19.20

Table 22: Change in mass (%) of FC mixes admixed with CD-RFA exposed to sulphuric and hydrochloric acid at dilution ratio of 1:20

Sample ID	change in mass (%)		Standard Deviation	
	Sulphate attack at dilution ratio (1:20)	Chloride attack at dilution ratio (1:20)	SD (1:20) at H ₂ SO ₄	SD (1:20) at HCl
Control mix	8.60	6.28	0.01	0.20
10% CD-RFA	10.42	8.42	0.64	0.54
30% CD-RFA	8.24	5.81	2.00	1.04
50% CD- RFA	11.01	7.45	1.14	1.10
70% CD-RFA	12.64	10.14	1.64	1.73
100% CD-RFA	15.74	12.55	0.01	0.36

Table 23: Change in mass (%) of FC mixes admixed with CD-RFA exposed to sulphuric and hydrochloric acid at dilution ratio of 1:40

Sample ID	change in mass (%)		Standard Deviation	
	Sulphate attack at Dilution ratio (1:40)	Chloride attack at Dilution ratio (1:40)	SD (1:40) at H ₂ SO ₄	SD (1:40) at HCl
Control mix	8.42	4.61	1.57	0.00
10% CD-RFA	9.61	5.29	1.05	0.71
30% CD-RFA	13.51	8.02	1.51	3.25
50% CD- RFA	8.50	7.58	2.78	0.49
70% CD-RFA	9.09	5.57	0.76	0.74
100% CD-RFA	12.15	8.86	0.76	0.22

Table 24: Change in mass (%) of FC mixes admixed with CD-RFA exposed to sulphuric and hydrochloric acid at dilution ratio of 1:60

Sample ID	change in mass (%)		Standard Deviation	
	Sulphate attack at Dilution ratio (1:60)	Chloride attack at Dilution ratio (1:60)	SD (1:60) at H ₂ SO ₄	SD (1:60) at HCl
Control mix	6.10526	4.52668	1.46739	0.06389
10% CD-RFA	6.01023	4.65214	0.36802	0.95903
30% CD-RFA	6.86627	6.67358	0.00283	0.17678
50% CD- RFA	9.23202	6.45916	0.28856	1.17822
70% CD-RFA	7.739	6.70863	2.00635	0.50831
100% CD-RFA	7.90866	7.5124	1.37838	0.33967

Table 25: Loss in compressive strength of FC mixes admixed with CD-RFA exposed to sulphuric acid at different dilution ratio

Sample ID	Loss in strength (%)			Standard Deviation		
	Sulphate attack at dilution ratio (1:20)	Sulphate attack at dilution ratio (1:40)	Sulphate attack at dilution ratio (1:60)	SD (1:20)	SD (1:40)	SD (1:60)
Control mix	39.19	40.16	22.27	0.33	6.92	6.16
10% CD-RFA	22.97	39.41	27.92	15.22	4.85	6.02
30% CD-RFA	25.52	30.43	25.41	7.95	12.08	2.31
50% CD-RFA	13.56	21.02	14.45	6.90	0.90	0.21
70% CD-RFA	34.81	20.37	24.68	14.57	0.93	8.51
100% CD-RFA	35.55	19.45	16.63	0.25	0.64	0.14

Table 26: Loss in compressive strength of FC mixes admixed with CD-RFA exposed to hydrochloric acid at different dilution ratio

Sample ID	Loss in compressive strength (%)			Standard Deviation		
	Chloride attack at dilution ratio (1:20)	Chloride attack at dilution ratio (1:40)	Chloride attack at dilution ratio (1:60)	SD (1:20)	SD (1:40)	SD (1:60)
Control mix	11.74	25.31	10.50	3.70	12.29	0.52
10% CD-RFA	12.37	23.21	26.26	5.44	12.29	0.96
30% CD-RFA	22.64	12.24	21.36	15.13	5.18	1.40
50% CD- RFA	12.39	7.41	9.63	8.55	7.15	0.44
70% CD-RFA	13.50	19.41	18.61	4.01	7.25	11.25
100% CD-RFA	26.57	18.32	16.20	15.28	2.12	1.61

Table 27: Hardened properties of FC mixes admixed with CWTP at dilution ratio of 1:40

Sample ID	Dry density (kg/m ³)	Plastic density (kg/m ³)	Bulk density (SSD) (kg/m ³)	Apparent density (kg/m ³)	Volume of permeable voids (kg/m ³)	Porosity (%)	water Absorption (%)	Standard Deviation					
								Dry Density	Bulk density (SSD)	Apparent Density	Volume of permeable voids	Porosity	Water Absorption
Control mix	1765.11	1815.00	1992.70	2285.13	22.76	22.58	12.90	34.31	29.07	31.02	0.74	0.77	0.63
10% CWTP	1760.00	1760.00	2004.51	2329.16	24.42	21.36	13.88	47.55	45.92	63.61	1.12	0.57	0.24
30% CWTP	1541.00	1630.00	1658.94	1747.51	11.77	10.36	7.63	36.51	48.22	66.34	1.58	1.52	0.86
50% CWTP	1581.58	1690.00	1876.84	2244.61	29.53	23.12	18.71	67.04	61.81	90.63	1.96	0.89	0.38
70% CWTP	1681.00	1820.00	1973.81	2378.23	29.31	22.94	17.46	81.99	87.06	132.82	0.66	0.58	0.35
90% CWTP	1427.00	1710.00	1795.54	2260.60	36.81	24.78	25.78	26.54	40.78	97.11	1.66	0.57	0.19

Table 28: Mechanical strength properties of FC mixes admixed with CWTP at dilution ratio of 1:40

Sample ID	Compressive strength (MPa)			Split tensile strength (MPa)	Flexural strength (MPa)	Standard Deviation				
	7 days	28 days	90 days			7 days	28 days	90 days	Split tensile strength	Flexural strength
Control mix	16.67	22.35	28.31	2.18	4.68	1.21	3.41	4.02	0.52	0.45
10% CWTP	7.98	12.28	16.01	1.89	5.06	0.47	0.63	1.91	0.19	2.93
30% CWTP	12.46	14.94	17.00	1.65	4.86	2.68	8.63	2.20	0.22	0.61
50% CWTP	7.13	9.34	10.29	1.65	4.50	0.80	2.75	0.83	0.22	0.37
70% CWTP	6.78	7.03	9.37	1.22	4.52	0.55	1.73	1.49	0.41	0.14
90% CWTP	1.07	1.26	3.99	0.32	0.35	0.10	0.20	0.20	0.13	0.20

Table 29: Sorptivity of FC mixes admixed with CWTP at dilution ratio of 1:40

Time (Sec ^{1/2})	Sample ID					
	Control mix	10% CWTP	30% CWTP	50% CWTP	70% CWTP	90% CWTP
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
7.7460	0.7836	0.5387	0.6551	0.6581	0.5449	1.2520
17.3205	1.4356	1.0377	1.3867	1.6836	2.0662	1.9193
24.4949	1.7570	1.3683	1.9223	2.2101	2.9600	2.1917
34.6410	1.9560	1.5152	2.1305	2.6019	3.8386	2.5162
42.4264	2.3478	1.7050	2.3876	2.8835	4.4110	2.7060
60.0000	2.7274	2.3417	3.1039	3.6610	5.2711	2.8835
84.8528	3.7590	2.8039	3.4682	4.0528	5.7058	3.1131
103.9230	3.9457	3.0764	3.7528	4.2549	5.9109	3.3304
120.0000	4.2059	3.4682	4.0651	4.5089	6.1160	3.5018
134.1641	4.6222	3.8324	4.3926	4.9589	6.4343	3.8753
146.9694	5.1732	4.3314	4.7263	5.1609	6.6425	4.3589
303.6775	5.8344	4.7691	5.0875	5.5527	6.8200	4.7997
439.5452	5.9843	5.2803	5.5374	5.8497	7.0251	5.1609
518.1699	6.3394	5.5925	5.9690	6.1252	7.1935	5.5221
657.2671	6.4833	5.9997	6.2354	6.4496	7.3771	6.1435
726.3470	6.7312	6.3211	6.6394	6.7894	7.4751	6.8567
788.7966	6.9302	6.5782	7.0190	7.1108	7.5975	7.4506
831.3844	7.0802	6.9027	7.3924	7.5302	7.7077	7.7689
881.8163	7.2792	7.1384	7.6710	7.7995	7.8057	8.1608
929.5160	7.4230	7.4598	8.0169	8.0903	7.9404	8.4179

Table 30: Change in mass (%) of FC mixes admixed with CWTP exposed to sulphuric and hydrochloric acid at dilution ratio of 1:40

Sample ID	Change in mass (%)		Standard Deviation	
	Sulphate attack at Dilution ratio	Chloride attack at Dilution ratio	SD (H ₂ SO ₄)	SD (HCl)
Control mix	7.37	4.61	0.01	0.00
10% CWTP	9.62	6.72	0.58	0.20
30% CWTP	6.92	3.71	0.57	0.27
50% CWTP	9.48	5.50	0.07	1.36
70% CWTP	9.32	5.67	0.40	1.76
90% CWTP	13.48	12.20	1.35	1.05

Table 31: Change in mass ratio of FC mixes admixed with CWTP exposed to sulphuric and hydrochloric acid at dilution ratio of 1:40

Sample ID	Change in mass ratio (%)		Standard Deviation	
	Sulphate attack	Chloride attack	SD (H ₂ SO ₄)	SD (HCl)
Control mix	107.373	104.607	0.000	0.000
10% CWTP	109.622	106.721	0.006	0.002
30% CWTP	106.921	103.708	0.006	0.002
50% CWTP	109.483	105.496	0.001	0.012
70% CWTP	109.323	105.670	0.004	0.016
90% CWTP	113.482	112.196	0.013	0.008

Table 32: Loss in compressive strength of FC mixes admixed with CWTP exposed to sulphuric and hydrochloric acid at dilution ratio of 1:40

Sample ID	Loss in compressive strength (%)		Standard Deviation	
	Sulphate attack	Chloride attack	SD (H ₂ SO ₄)	SD (HCl)
Control mix	40.16	25.31	6.92	12.29
10% CWTP	25.48	14.81	0.98	1.69
30% CWTP	24.49	22.66	1.88	3.00
50% CWTP	16.02	9.45	1.25	4.87
70% CWTP	24.23	11.40	10.15	0.89
90% CWTP	22.45	21.35	10.20	7.56

Table 33: Loss in compressive strength ratio of FC mixes admixed with CWTP exposed to sulphuric and hydrochloric acid at dilution ratio of 1:40

Sample ID	Loss in compressive strength ratio (%)		Standard Deviation	
	Sulphate attack	Chloride attack	SD H2SO4	SD HCl
Control mix	59.840	74.694	0.069	0.123
10% CWTP	74.516	85.191	0.010	0.017
30% CWTP	75.514	77.340	0.019	0.030
50% CWTP	83.975	90.549	0.012	0.049
70% CWTP	75.767	88.597	0.102	0.009
90% CWTP	77.550	78.653	0.102	0.076

Table 34: Abrasion loss of FC mixes admixed with CWTP at dilution ratio of 1:40

Sample ID	Abrasion Loss (%)
Control Mix	15.9611
10% CWTP	17.7807
30% CWTP	23.0721
50% CWTP	21.5646
70% CWTP	18.9032
90% CWTP	95.2447

LIST OF PAPERS PUBLISHED ON THE BASIS OF THIS THESIS

1. Rodhia, R., Sahdeo, S.K. and Kumar, B., 2024. Optimizing foaming agent concentration and recycled fine aggregate content to enhance mechanical and durable properties of foam concrete mixes. *Journal of Building Engineering*, 97, p.110801.
2. Rodhia, R., Sahdeo, S.K. and Kumar, B., 2024. Mechanical, microstructural and durable characteristics of foam concrete ceramic mixes exposed to H₂SO₄ and HCl solution. *Construction and Building Materials*, 454, p.139080.
3. Rodhia, R., Pandey Arunabh and Kumar, B., Lightweight concrete and sustainability: Materials, performance and environmental benefits. *European Journal of Environmental and Civil Engineering* (Decision Pending).