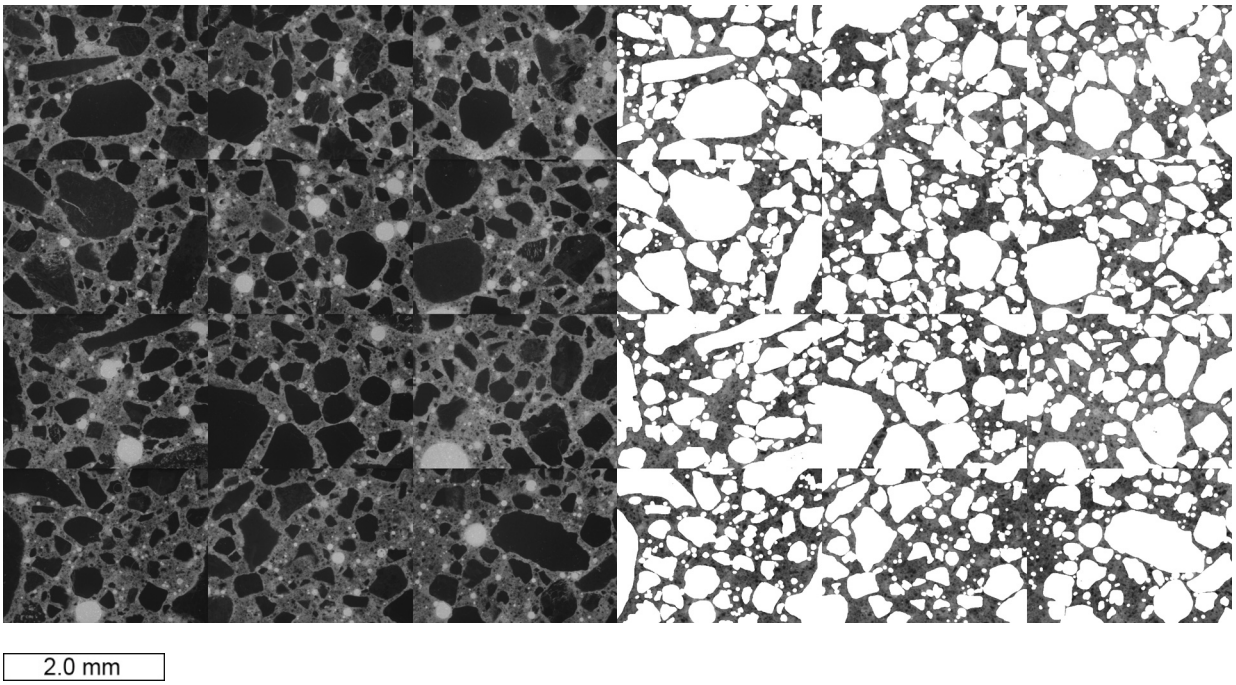

Figure 52: Mosaic of twelve images collected from LO-SYN-PC-6SK-45WC mixture (left), and after masking air-voids and sand to isolate fluorescence from the cement paste (right).

Table 20: Average fluorescence values measured in grey scale level from cement paste for each image collected from LO-SYN-PC-6SK-45WC mixture, and correlated equivalent *w/cm* values based on calibration curve.

Avg. intensity of individual images (grey scale level)				Equiv. *w/cm* based on 28d mortar stds.			
94	96	109	88	0.45	0.46	0.51	0.42
87	95	92	86	0.42	0.45	0.44	0.41
107	82	89	83	0.50	0.39	0.42	0.40
				Average	0.44	Std. dev.	0.04

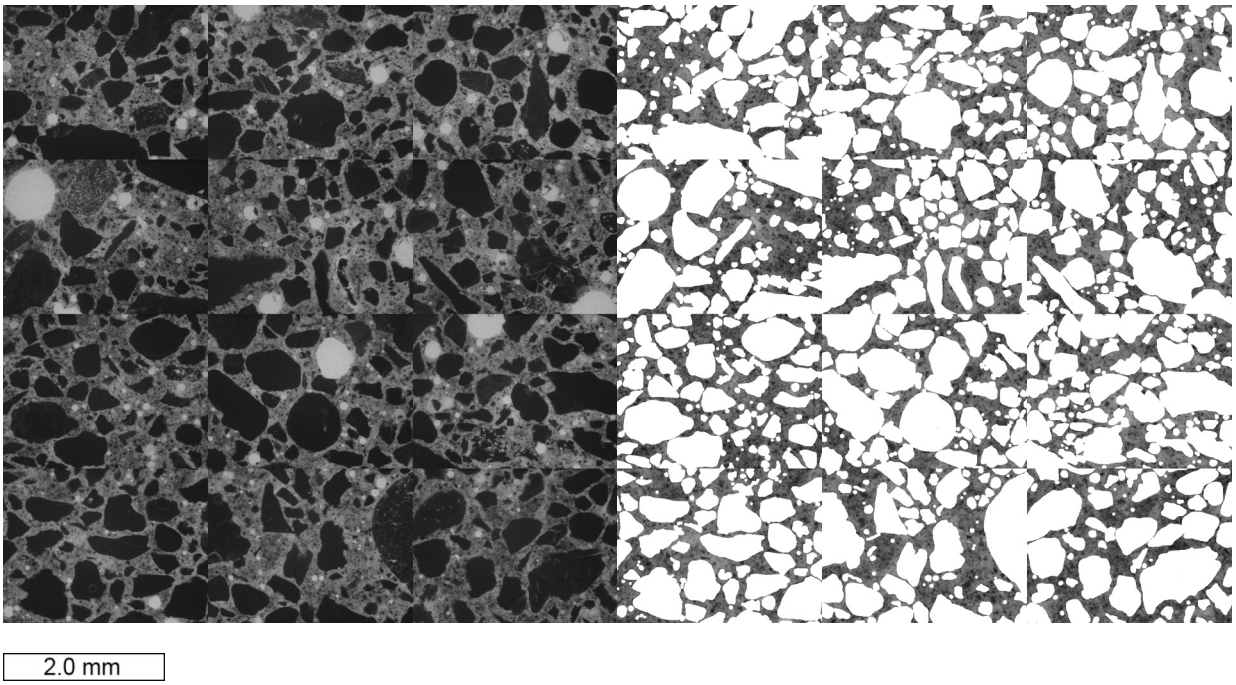

Figure 53: Mosaic of twelve images collected from LO-SYN-PC-6SK-50WC mixture (left), and after masking air-voids and sand to isolate fluorescence from the cement paste (right).

Table 21: Average fluorescence values measured in grey scale level from cement paste for each image collected from LO-SYN-PC-6SK-50WC mixture, and correlated equivalent *w/cm* values based on calibration curve.

Avg. intensity of individual images (grey scale level)				Equiv. *w/cm* based on 28d mortar stds.			
97	104	108	92	0.46	0.49	0.51	0.44
99	93	91	98	0.47	0.44	0.43	0.46
104	99	98	89	0.49	0.47	0.46	0.42
				Average	0.46	Std. dev.	0.03

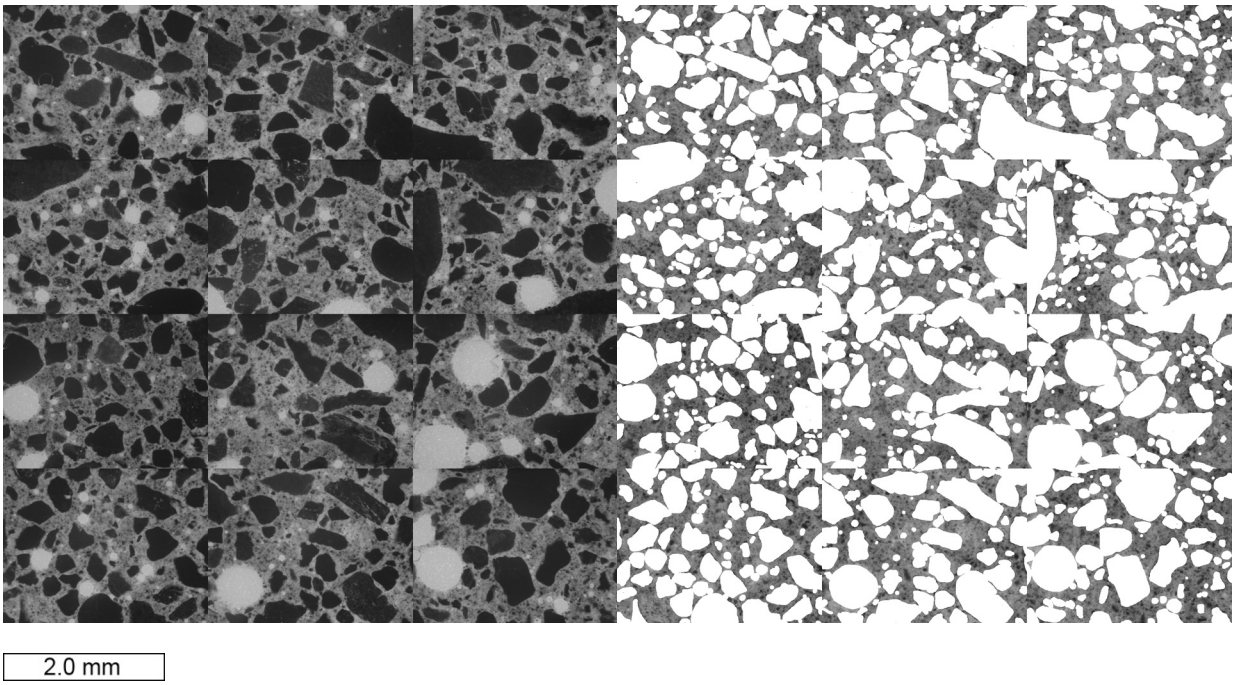

Figure 54: Mosaic of twelve images collected from LO-SYN-PC-5.5SK-52WC mixture (left), and after masking air-voids and sand to isolate fluorescence from the cement paste (right).

Table 22: Average fluorescence values measured in grey scale level from cement paste for each image collected from LO-SYN-PC-5.5SK-52WC mixture, and correlated equivalent *w/cm* values based on calibration curve.

Avg. intensity of individual images (grey scale level)				Equiv. *w/cm* based on 28d mortar stds.			
113	116	122	115	0.53	0.54	0.57	0.54
119	117	96	115	0.56	0.55	0.46	0.54
112	112	116	108	0.53	0.53	0.54	0.51
				Average	0.53	Std. dev.	0.03

5.2.5 Petrographic Examination of Selected Mixtures.

Fluorescent resin impregnated thin sections were also prepared from a subset of Phase II mixtures selected from two categories:

- Mixtures in which one batch performed poorly in F-T testing while the duplicate batch performed well (the LO-VR-SLG-5SK-45WC and LO-SYN-FA-6SK-45WC mixtures).
- The delayed set mixture (LO-SYN-SLG-6SK-45WC) and the counterpart mixture that did not experience a delay in set (LO-VR-SLG-6SK-45WC).

Photomicrographs were recorded from regions of mortar, and the degree of fluorescence measured, as shown in Figures 55-60. Calibration curves were not developed for mixtures with SCMs, and the equivalent *w/cm* values listed in Tables 23-28 were computed using the same 28-day moist cured 100% portland cement 20-30 Ottawa sand mortar standards.

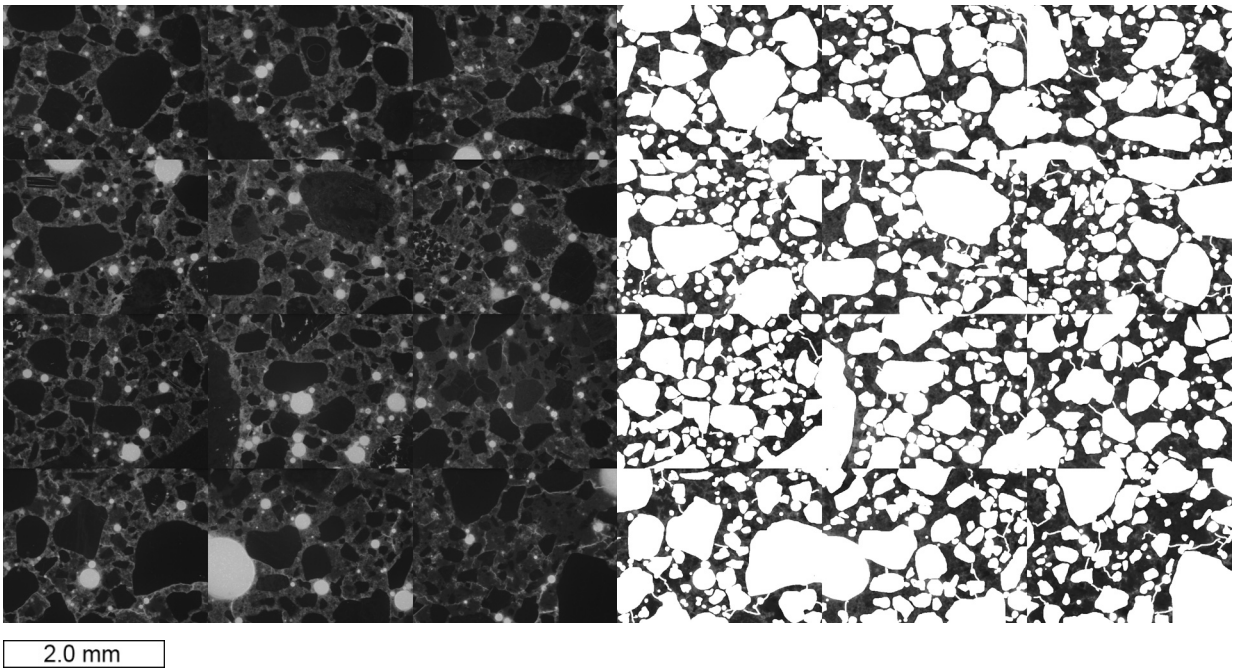

Figure 55: Mosaic of twelve images collected from the good F-T performance LO-VR-SLG-5SK-45WC mixture (left), and after masking air-voids and sand to isolate fluorescence from the cement paste (right).

Table 23: Average fluorescence values measured in grey scale level from cement paste for each image collected from the poor F-T performance LO-VR-SLG-5SK-50WC mixture, and correlated equivalent *w/cm* values based on calibration curve.

Avg. intensity of individual images (grey scale level)			
58	62	55	66
65	59	50	65
54	58	56	48

Equiv. *w/cm* based on 28d mortar stds.			
0.29	0.31	0.27	0.32
0.32	0.29	0.25	0.32
0.27	0.29	0.28	0.24
Average	0.29	Std. dev.	0.03

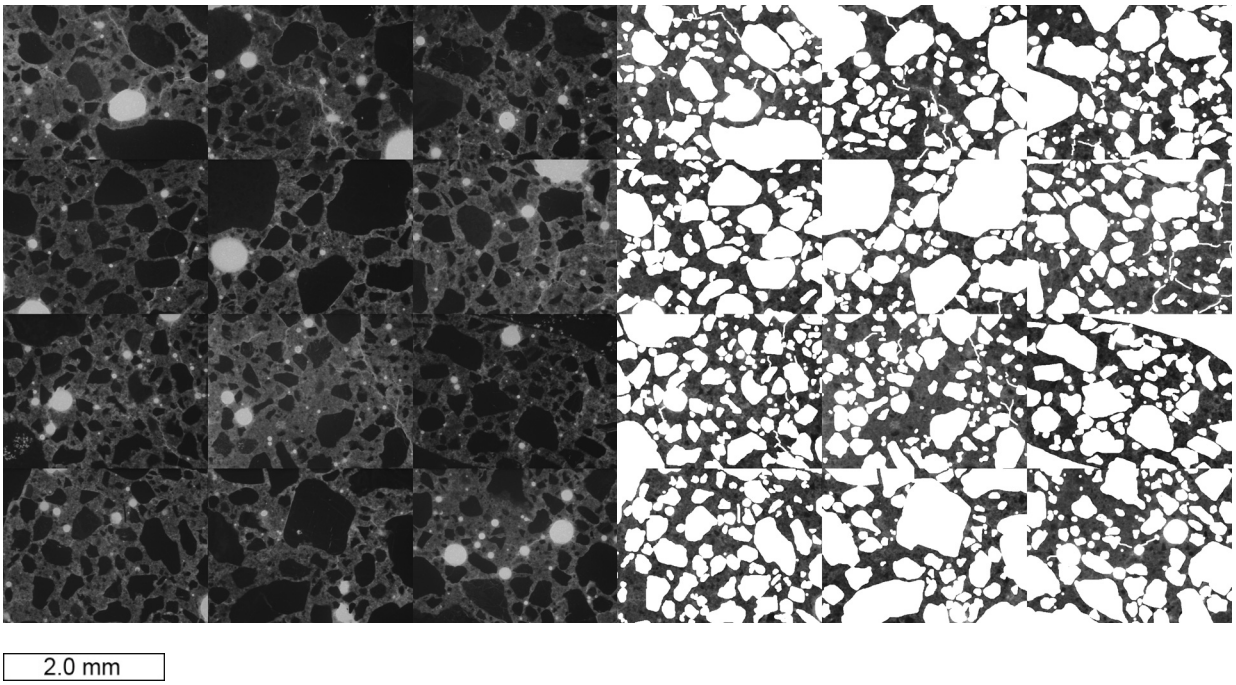

Figure 56: Mosaic of twelve images collected from the poor F-T performance LO-VR-SLG-5SK-45WC mixture (left), and after masking air-voids and sand to isolate fluorescence from the cement paste (right).

Table 24: Average fluorescence values measured in grey scale level from cement paste for each image collected from the poor F-T performance LO-VR-SLG-5SK-50WC mixture, and correlated equivalent *w/cm* values based on calibration curve.

Avg. intensity of individual images (grey scale level)				Equiv. *w/cm* based on 28d mortar stds.			
79	60	60	59	0.38	0.30	0.30	0.29
68	77	64	78	0.33	0.37	0.31	0.38
50	66	65	70	0.25	0.32	0.32	0.34
				Average	0.32	Std. dev.	0.04

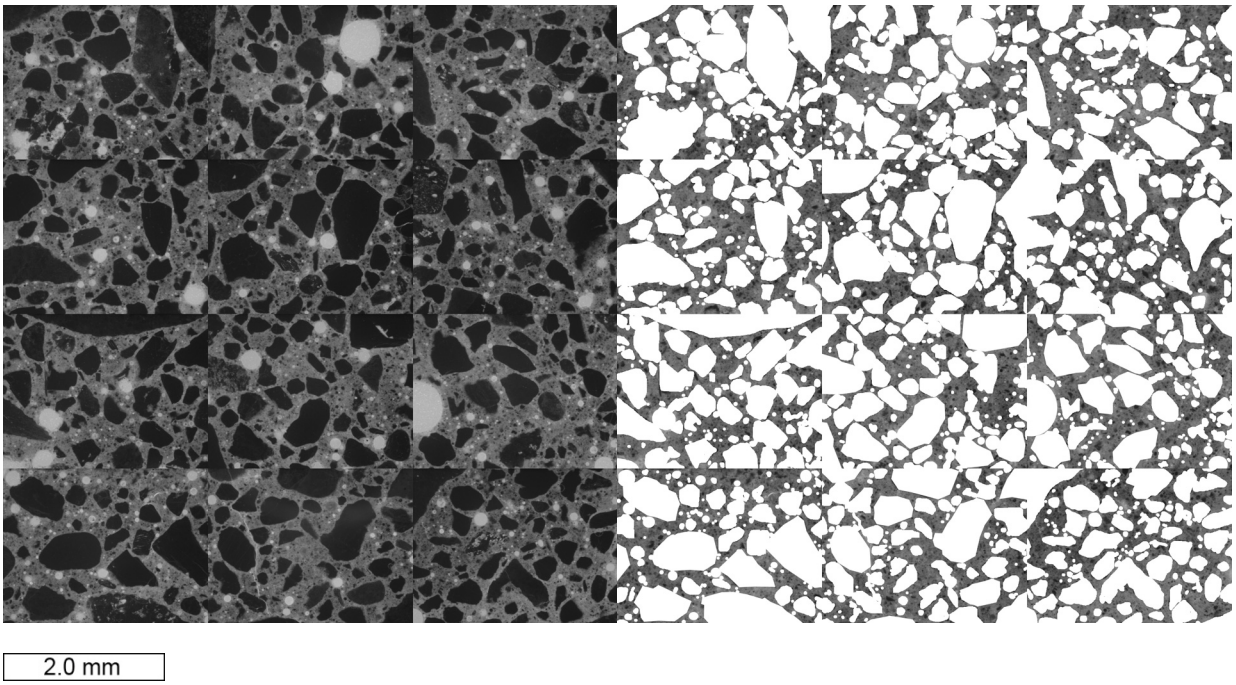

Figure 57: Mosaic of twelve images collected from the good F-T performance LO-SYN-FA-6SK-45WC mixture (left), and after masking air-voids and sand to isolate fluorescence from the cement paste (right).

Table 25: Average fluorescence values measured in grey scale level from cement paste for each image collected from the good F-T performance LO-SYN-FA-6SK-45WC mixture, and correlated equivalent *w/cm* values based on calibration curve.

Avg. intensity of individual images (grey scale level)				Equiv. w/cm based on 28d mortar stds.			
96	102	100	99	0.46	0.48	0.47	0.47
89	91	99	103	0.42	0.43	0.47	0.49
105	102	101	93	0.49	0.48	0.48	0.44
				Average	0.47	Std. dev.	0.02