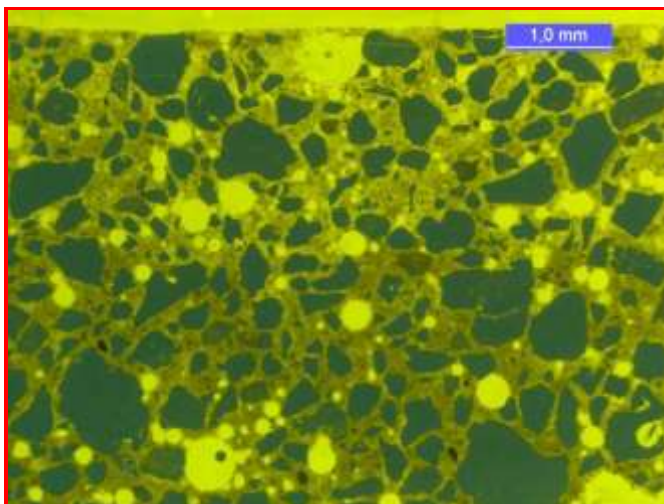




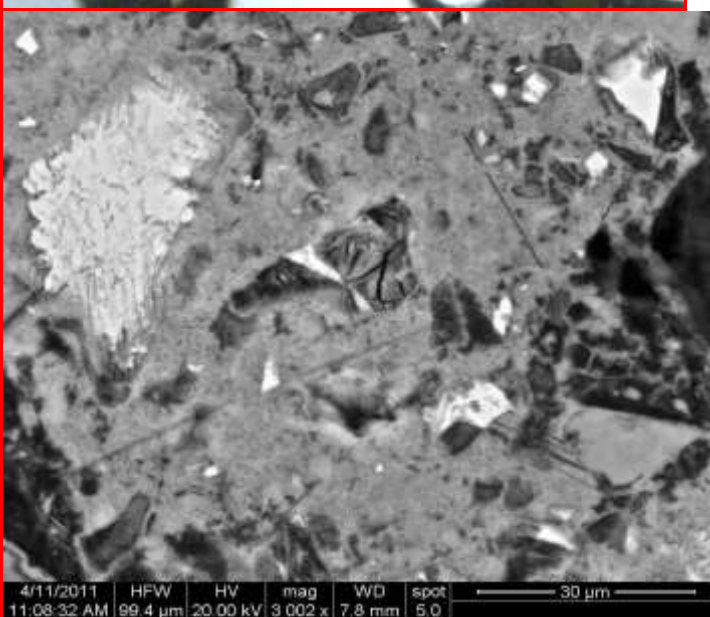
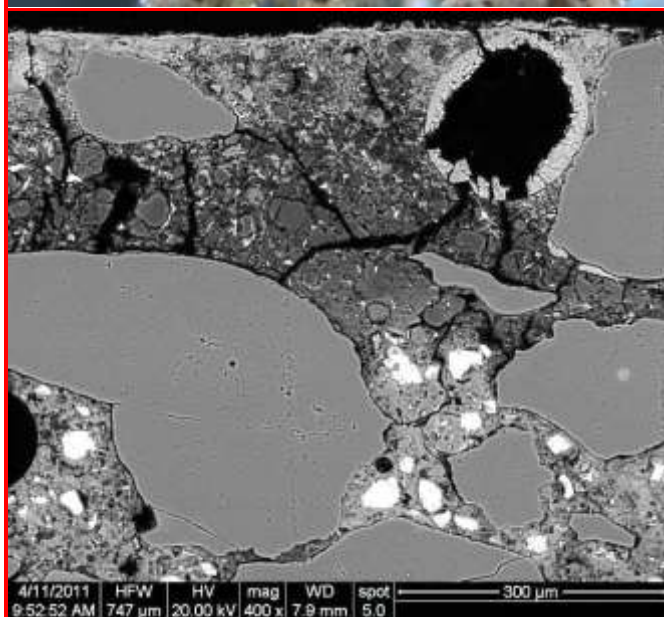
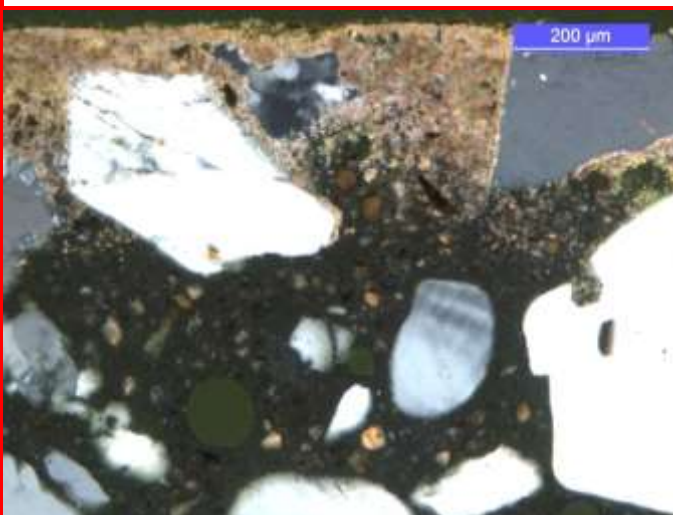
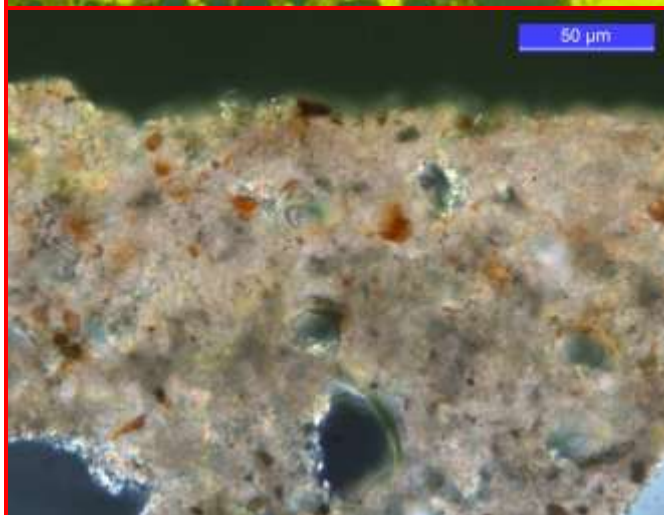
Concrete No.: Femern A; CEM I, w/c 0.40

Age: 6 mth's



Micro-observations (west)

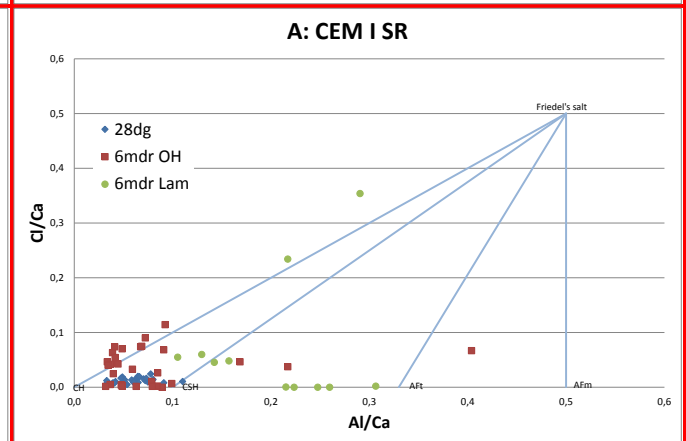
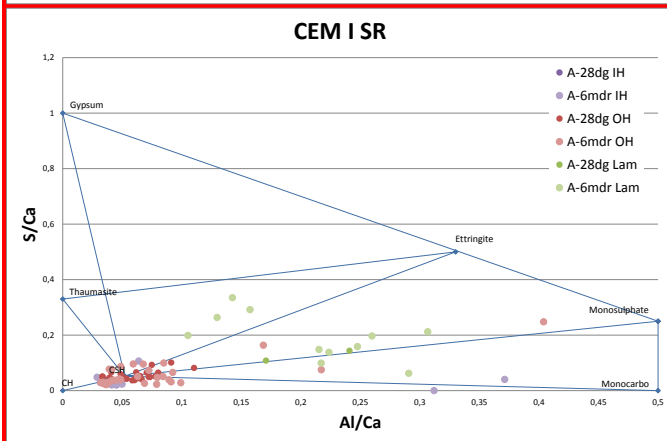
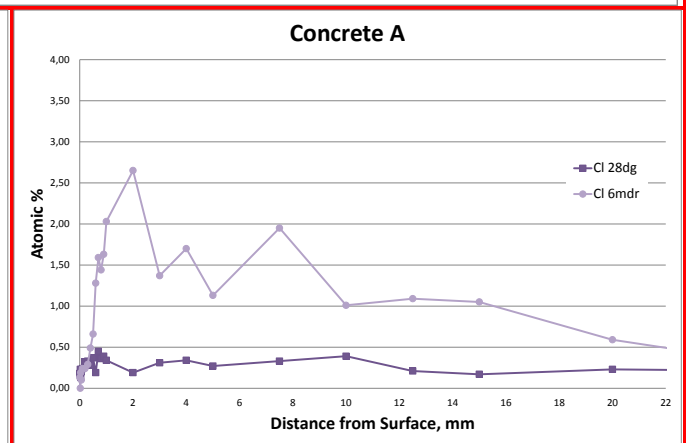
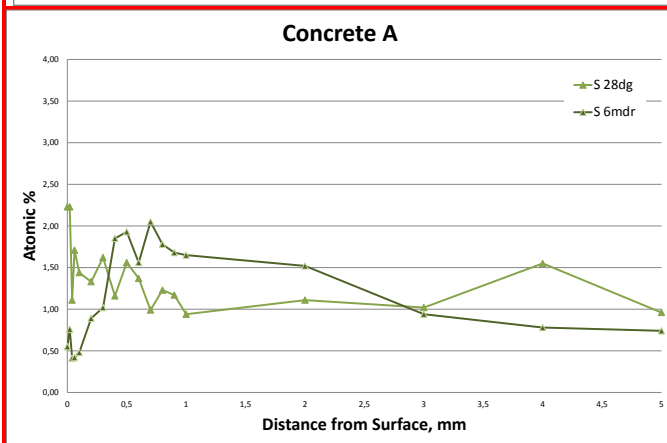
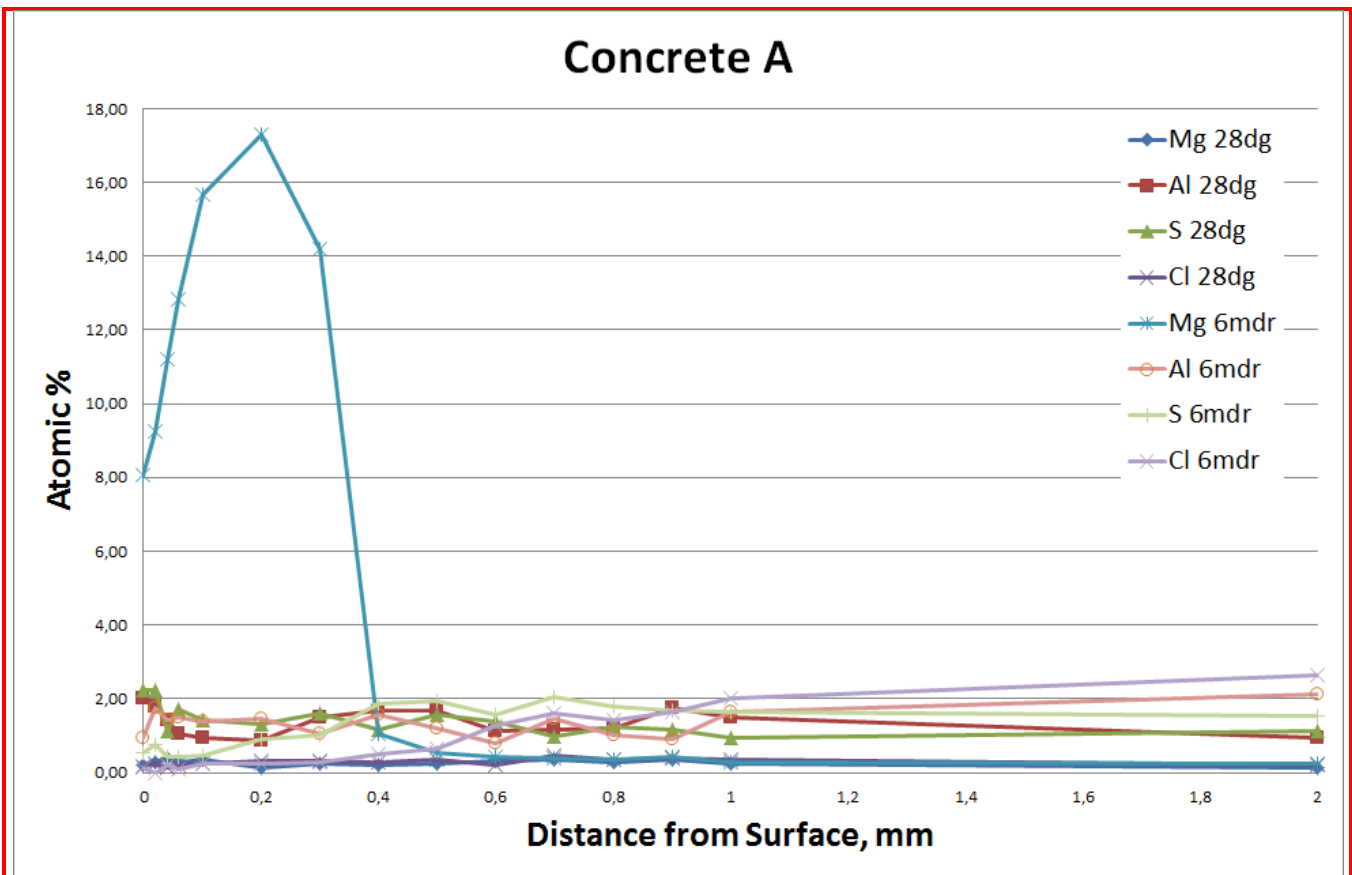
Calcite crust at surface
Carbonated paste to 0.24mm, max. 0.8mm
Calcite crystals in voids in carbonated zone
Rusty spots present in carbonated zone
Leached zone beneath carbonation, to 2.2mm
Ettringite needles in air voids of leached zone
Increased porosity in upper 2.45-3mm
Relatively large CH crystals in interior paste and in adhesion defects
W/c estimated to about 0.45
Generally no cracks in surface
Generally no cracks in paste except few adhesion cracks
Relatively poor air void structure





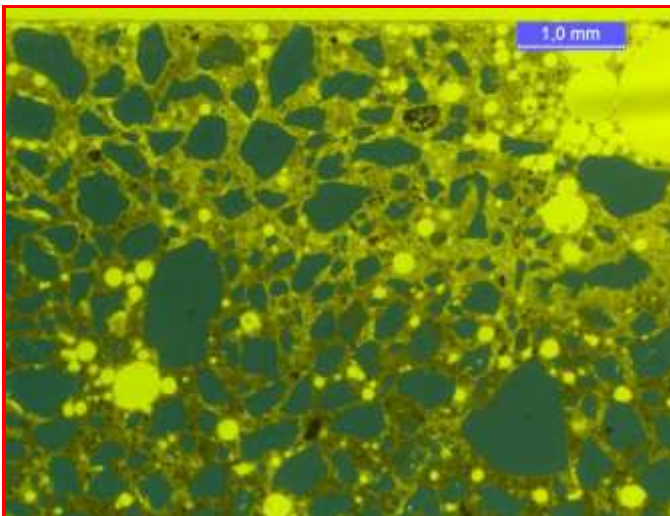
Concrete No.: Femern A; CEM I, w/c 0.40

Age: 6 mth's



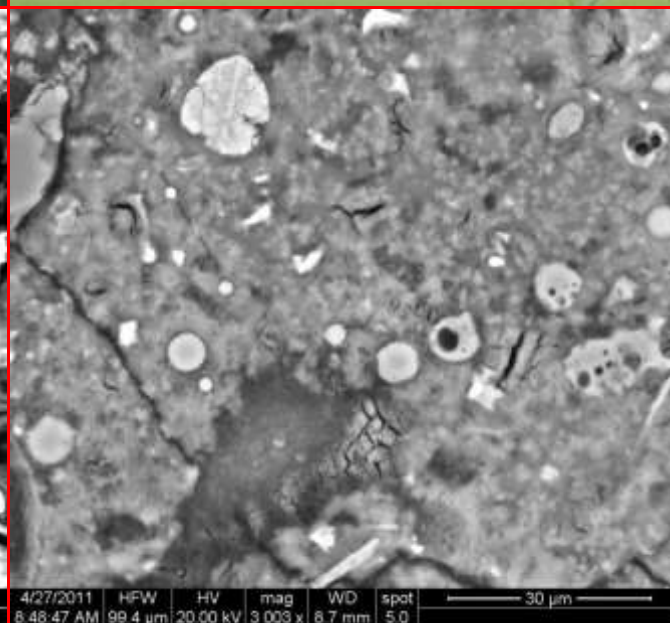
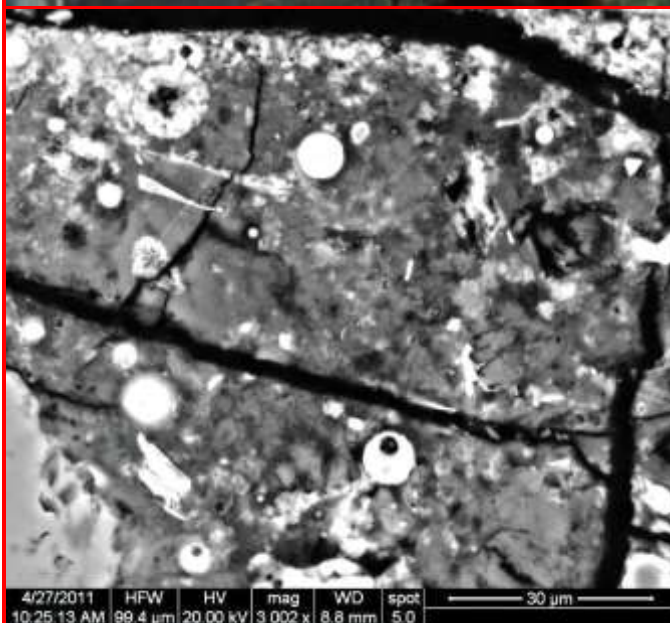
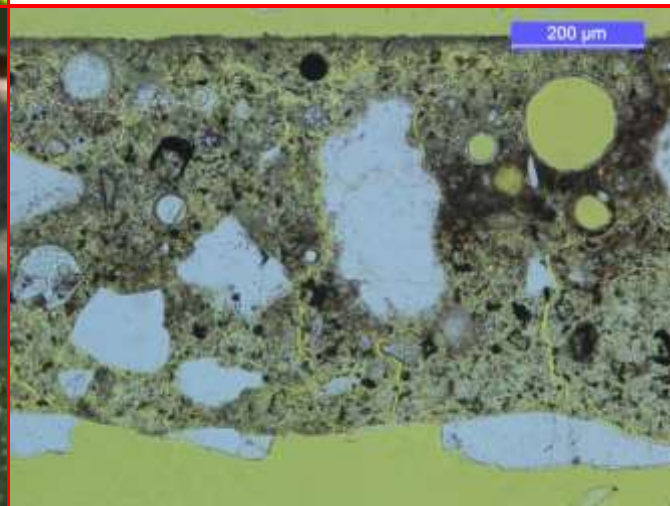
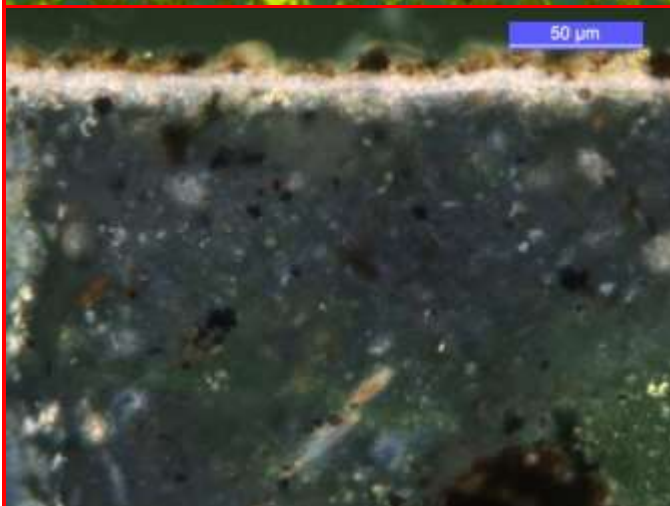
Concrete No.: Femern B; CEM I, 15% FA, w/c 0.40

Age: 6 mth's



Micro-observations (west)

Calcite crust at surface
Carbonated paste to 0.03mm, max. 0.5mm
Leached zone beneath carbonation, to 2.5mm
Ettringite needles in air voids of leached zone; to max. 15mm
Increased porosity in upper 2-3mm
Relatively large CH crystals in interior paste and in adhesion defects
W/c estimated to about 0.45
Some small, fine cracks in surface region
Generally no cracks in paste except few adhesion cracks
Some agglomerated air voids

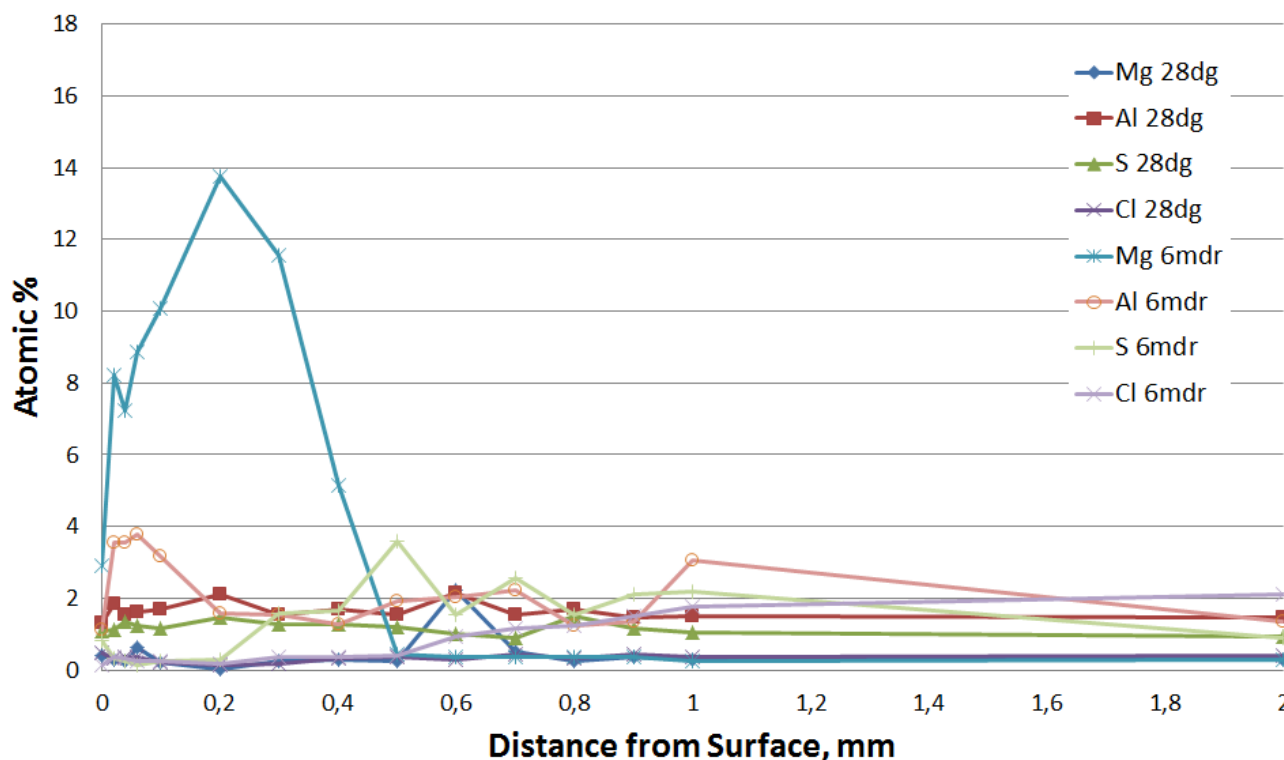




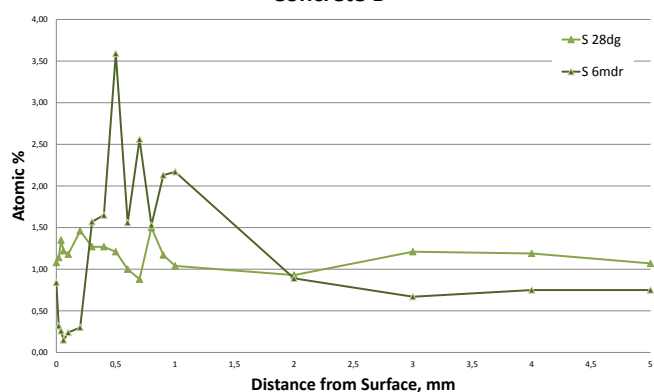
Concrete No.: Femern B; CEM I, 15% FA, w/c 0.40

Age: 6 mth's

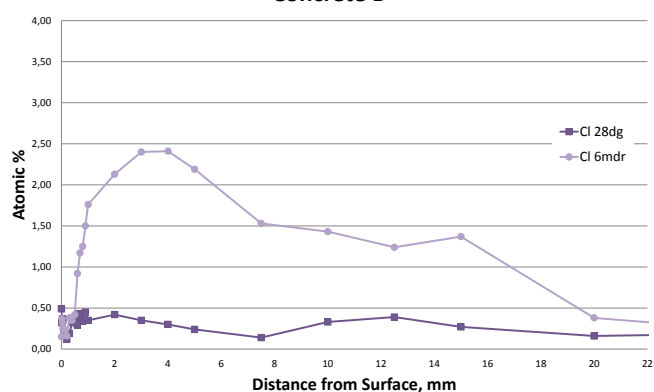
Concrete B



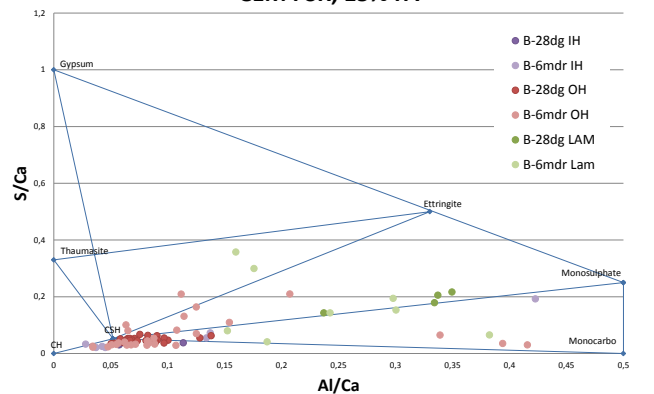
Concrete B



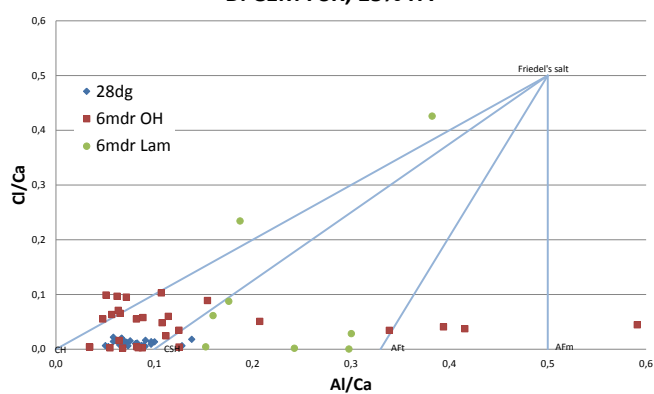
Concrete B



CEM I SR, 15% FA

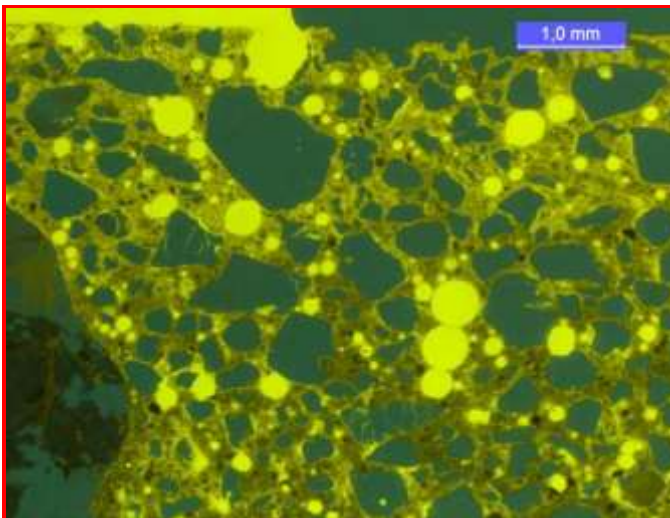


B: CEM I SR, 15% FA



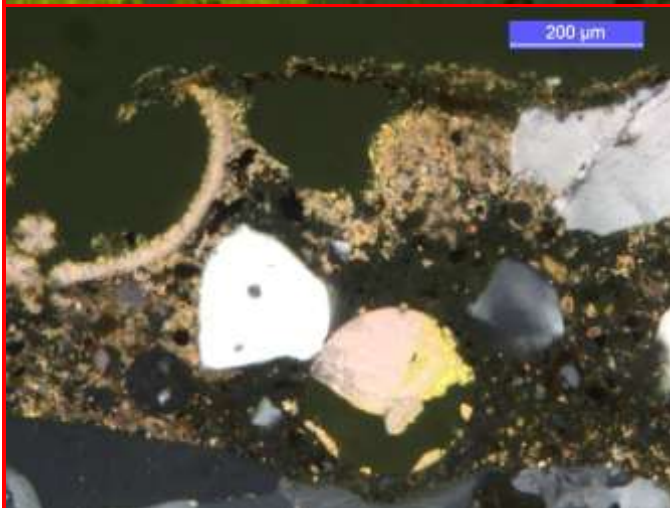
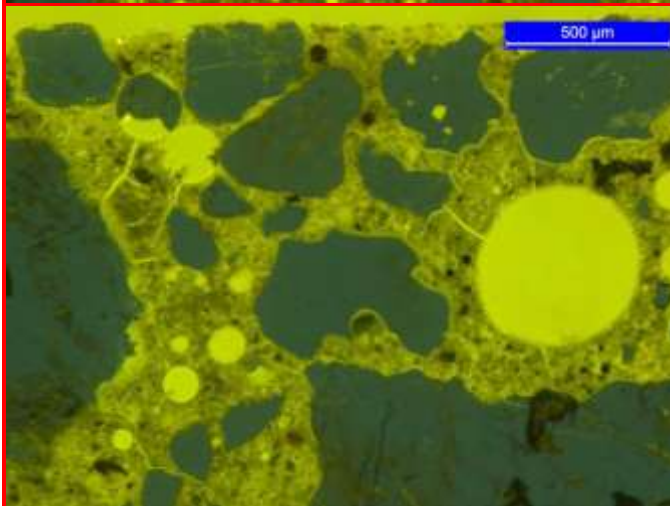
Concrete No.: Femern C; CEM I, 25% FA, w/c 0.40

Age: 6 mth's



Micro-observations (west)

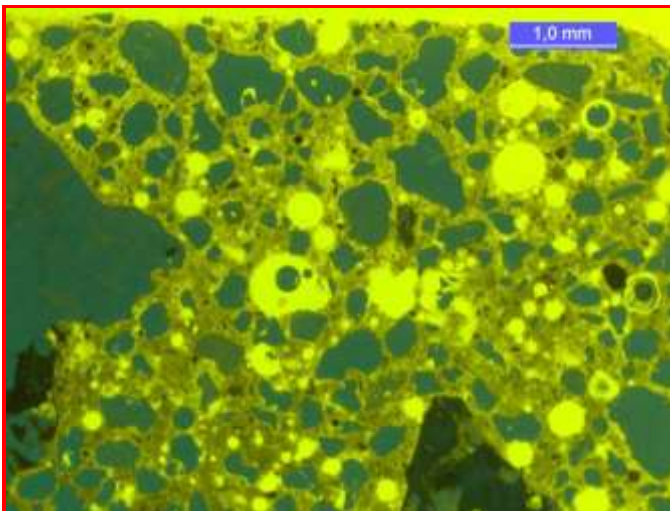
Carbonated paste to 0.24mm, max. 1.2mm
Popcorn carbonation, calcite crystals in voids
Leached zone beneath carbonation, to 2.5mm
Biological growth at surface
Rusty spots present in carbonated zone
Ettringite needles in air voids of leached zone; to max. 4mm
Increased porosity in upper 2-3mm
Relatively large CH crystals in interior paste and in adhesion defects
W/c estimated to about 0.45
Some small, fine cracks in surface region
Generally no cracks in interior paste



Concrete No.:

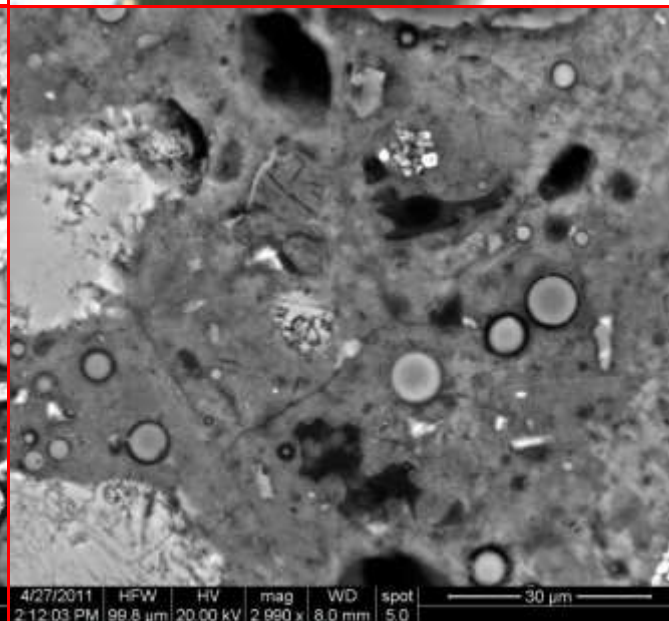
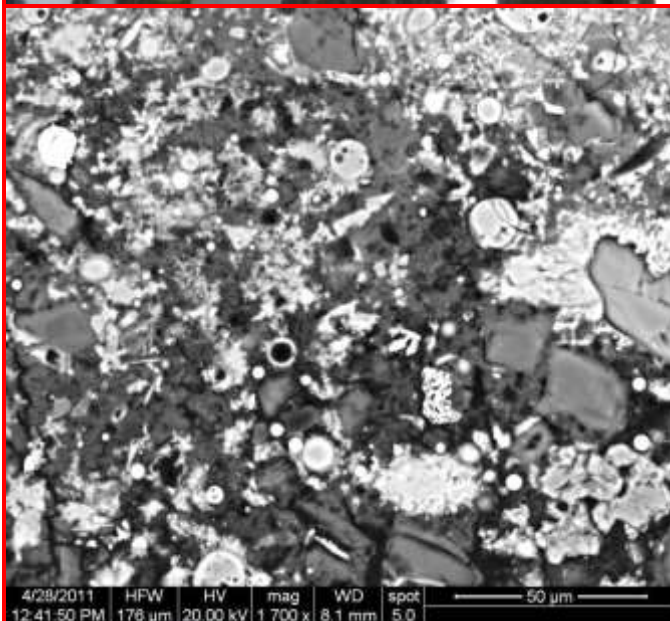
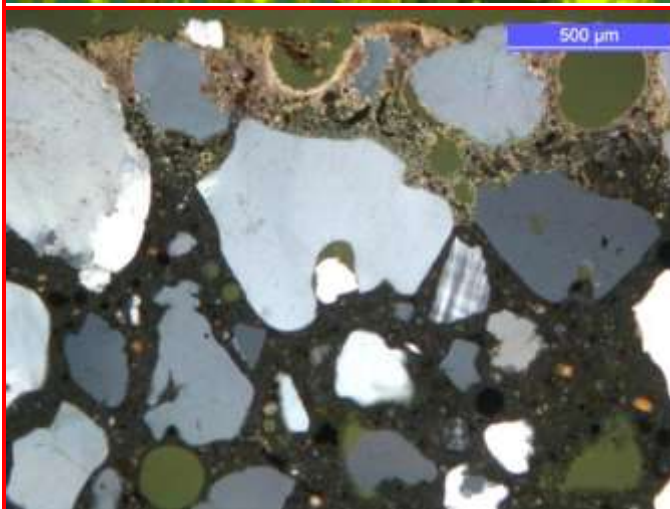
Femern D; SCC CEM I, 25% FA, w/c 0.40

Age: 6 mth's



Micro-observations (west)

Carbonated paste 0.2-0.4mm, max. 0.8mm
Popcorn carbonation, calcite crystals in voids
Leached zone beneath carbonation, to 2mm
Minor biological growth at surface
Rusty spots present in carbonated zone
Ettringite needles in air voids of leached zone; to max. 6mm (maybe gypsum)
Increased porosity in upper 0.5mm
Relatively large CH crystals in interior paste and in adhesion defects
W/c estimated to about 0.45
Some small, plastic cracks in surface region; brittle in leached zone
Generally no cracks in interior paste

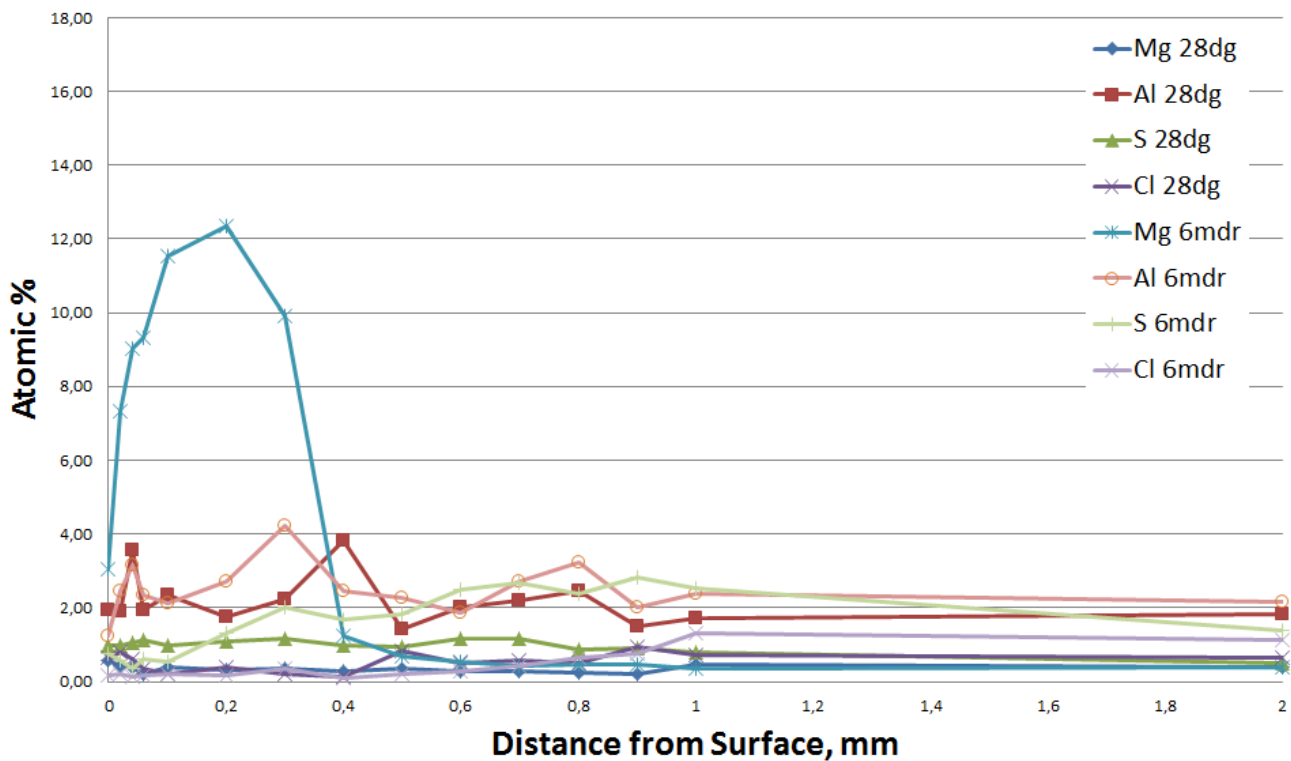




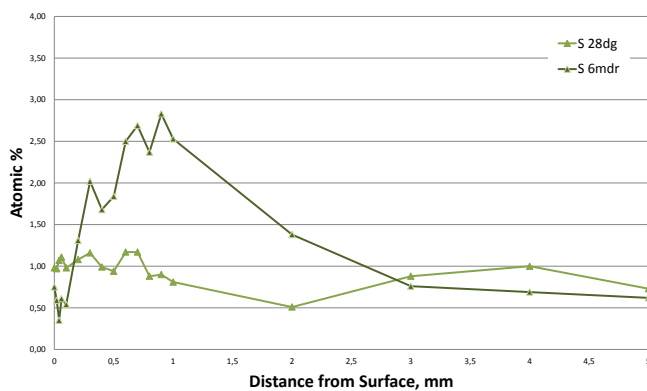
Concrete No.: Femern D; SCC CEM I, 25% FA, w/c 0.40

Age: 6 mth's

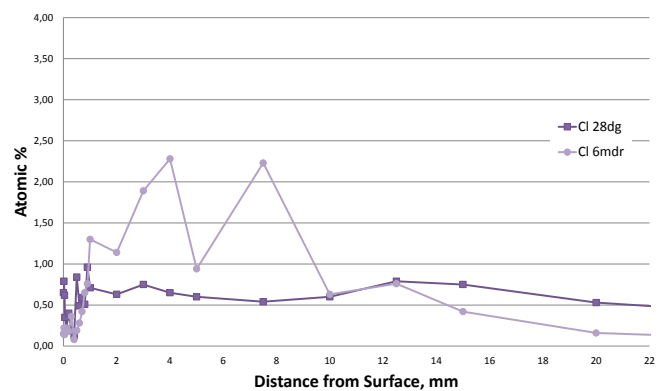
Concrete D



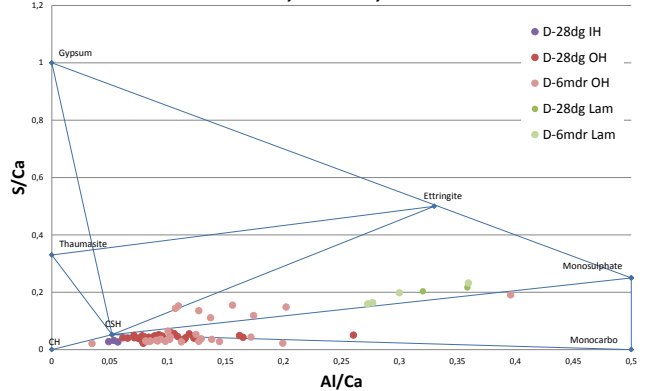
Concrete D



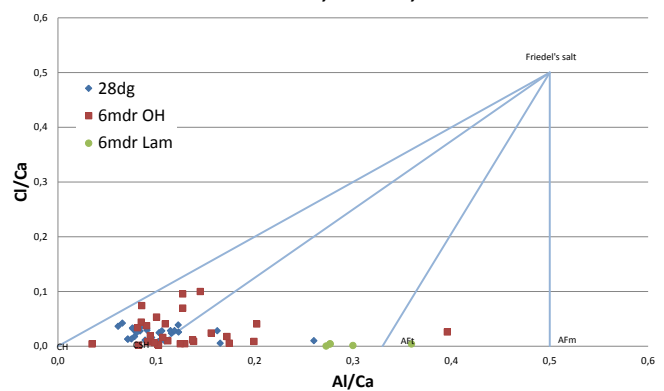
Concrete D



CEM I, 25% FA, SCC

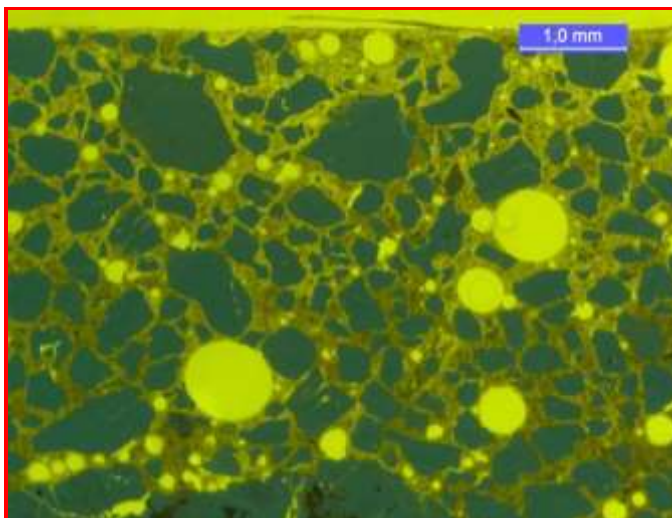


D: CEM I SR, 25% FA, SCC



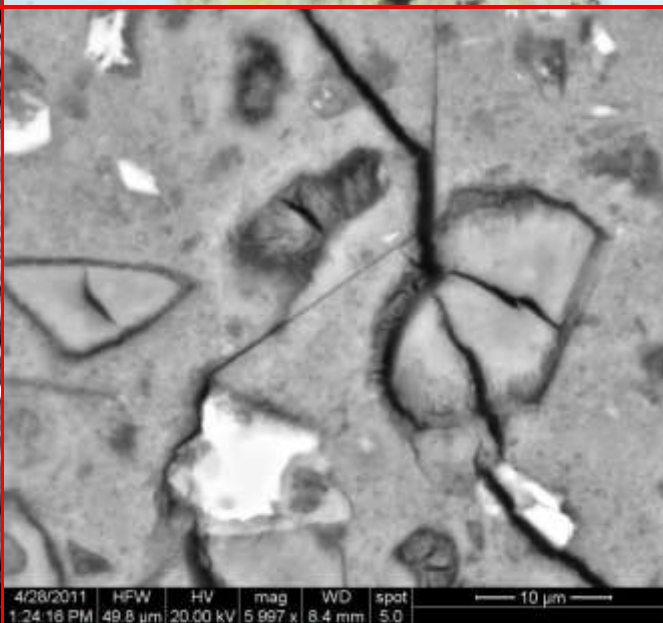
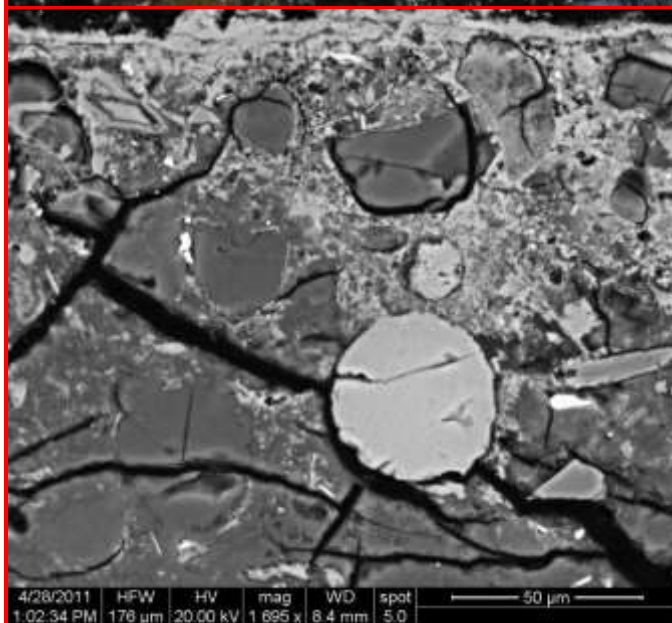
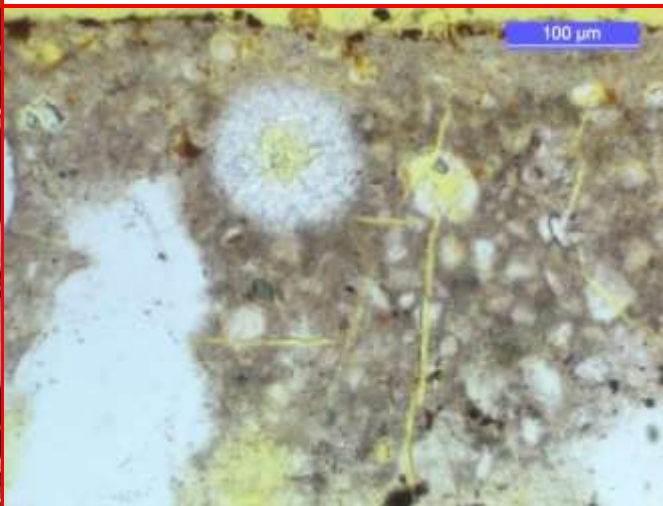
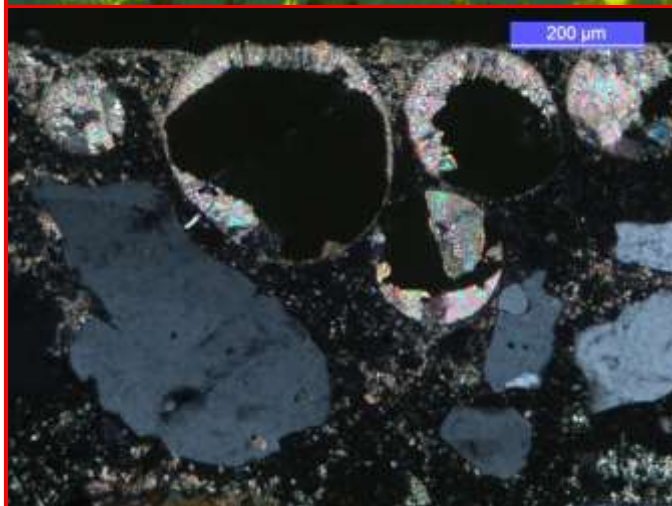
Concrete No.: Femern E; CEM I, 4% MS, w/c 0.40

Age: 6 mth's



Micro-observations (west)

Carbonated paste 0.2-0.3mm, max. 1mm
 Popcorn carbonation, calcite crystals in voids
 Leached zone beneath carbonation, to 2,5mm
 Minor biological growth at surface
 Rusty spots present in carbonated zone
 Ettringite needles in air voids of leached zone; to max. 3,2mm
 Increased porosity in upper 2.5mm
 Relatively large CH crystals in interior paste and in adhesion defects
 W/c estimated to about 0.40
 Relatively high amount of small, brittle cracks in leached zone
 Generally no cracks in interior paste

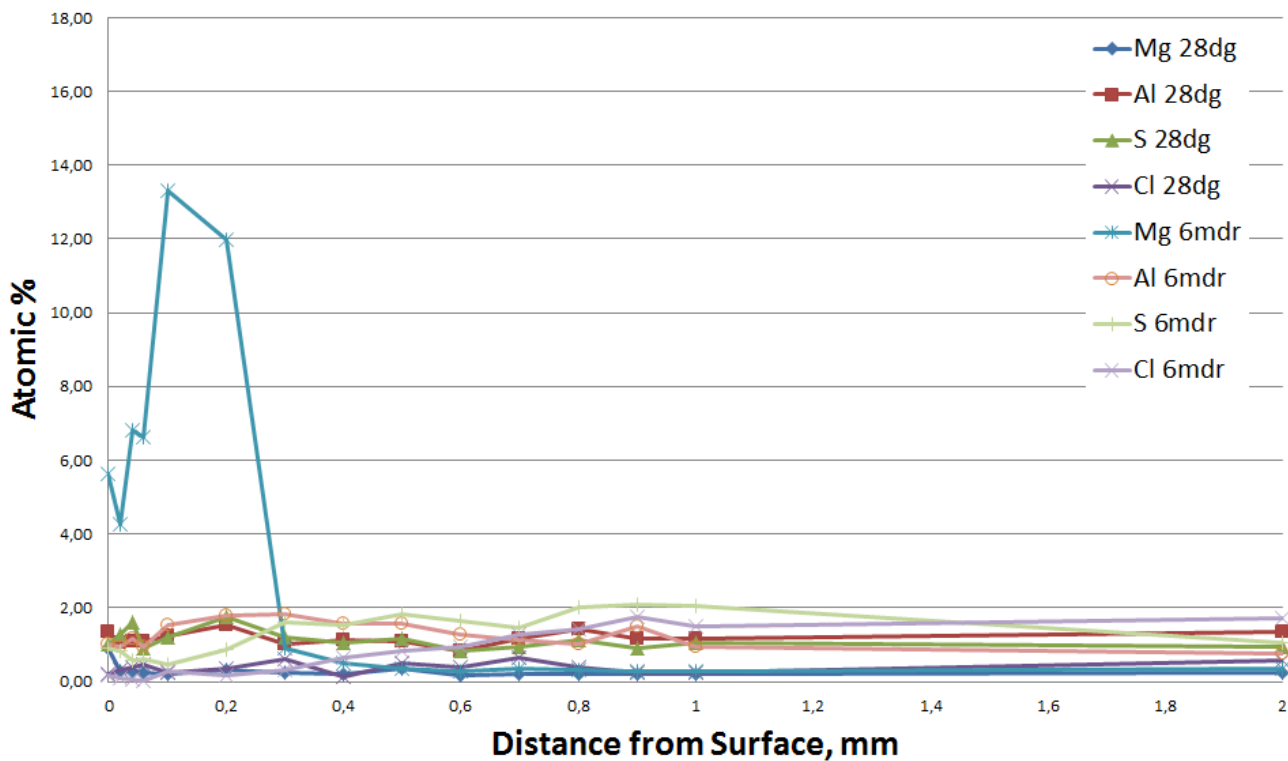




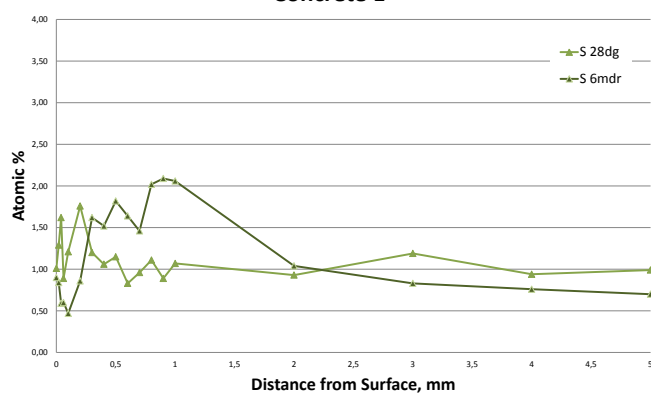
Concrete No.: Femern E; CEM I, 4% MS, w/c 0.40

Age: 6 mth's

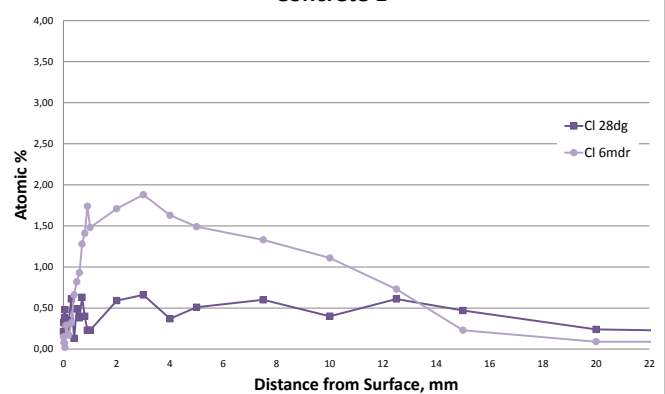
Concrete E



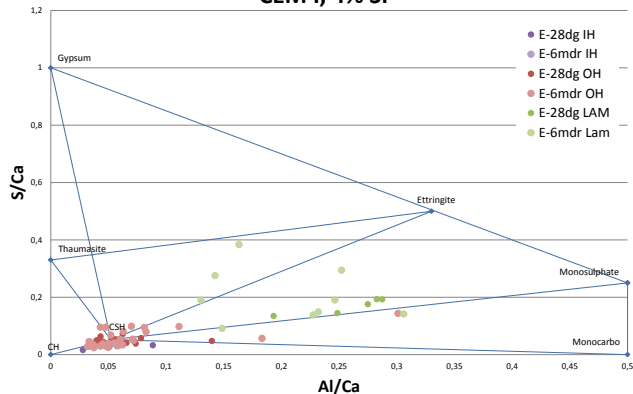
Concrete E



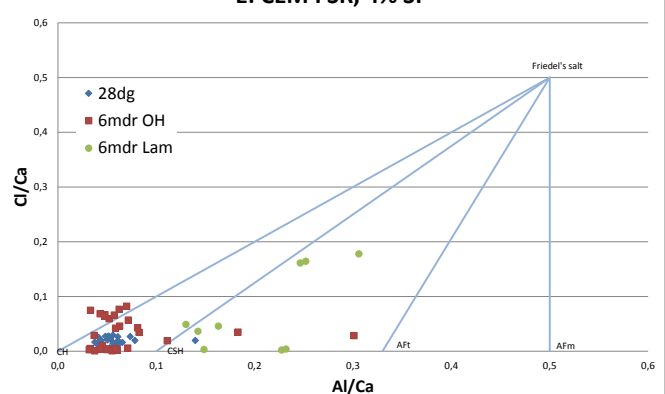
Concrete E



CEM I, 4% SF



E: CEM I SR, 4% SF

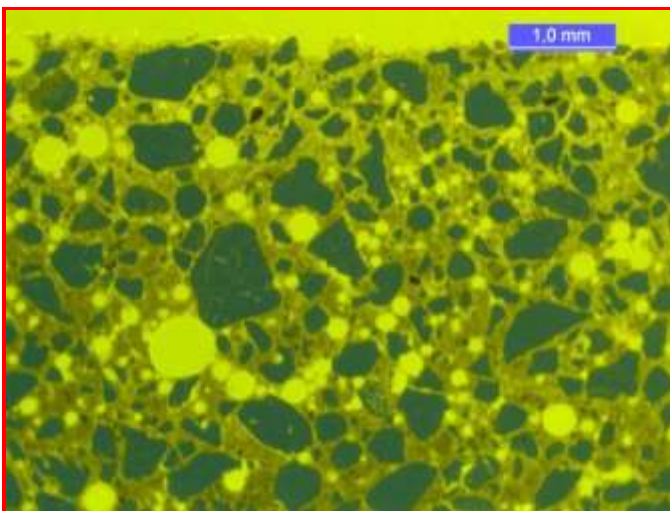




Concrete No.:

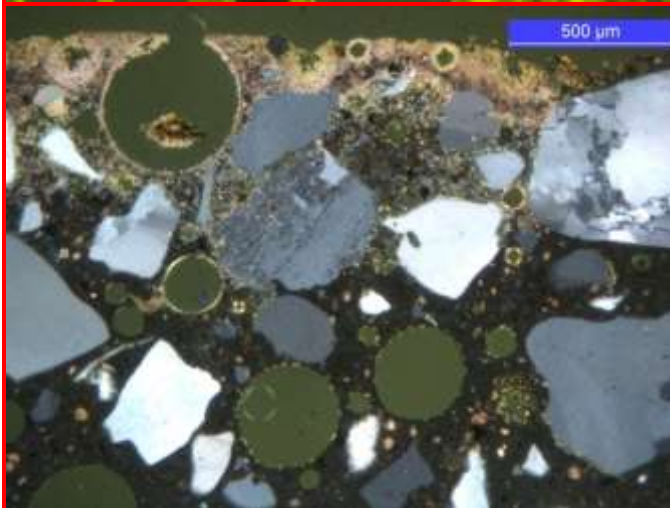
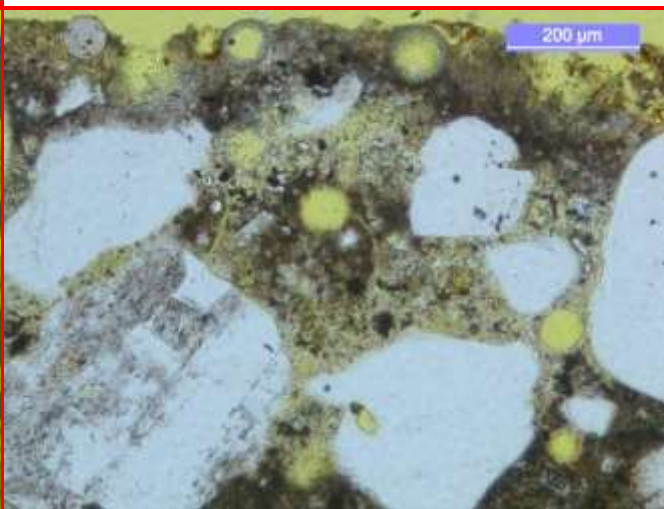
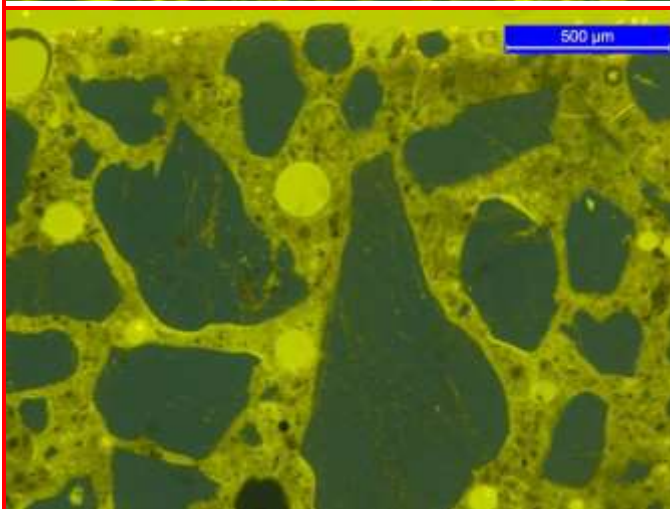
Femern F; CEM I, 12%FA, 4%MS, w/c 0.40

Age: 6 mth's



Micro-observations (west)

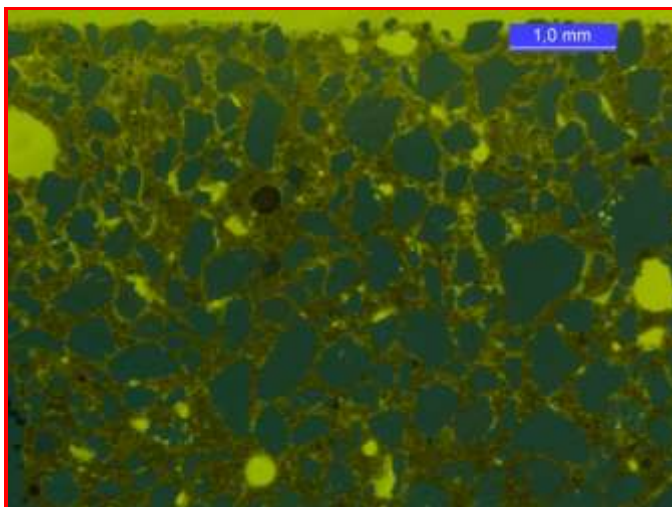
Carbonated paste 0.2mm, max. 0.5mm
Popcorn carbonation, calcite crystals in voids
Leached zone beneath carbonation, to 2mm
Minor biological growth at surface
Rusty spots present in carbonated zone
Ettringite needles in air voids of leached zone; to max. 3,1mm (maybe gypsum in voids)
Increased porosity in upper 2mm
Relatively large CH crystals in interior paste and in adhesion defects
W/c estimated to about 0.45
Relatively high amount of small, brittle cracks in leached zone
Generally no cracks in interior paste



Concrete No.:

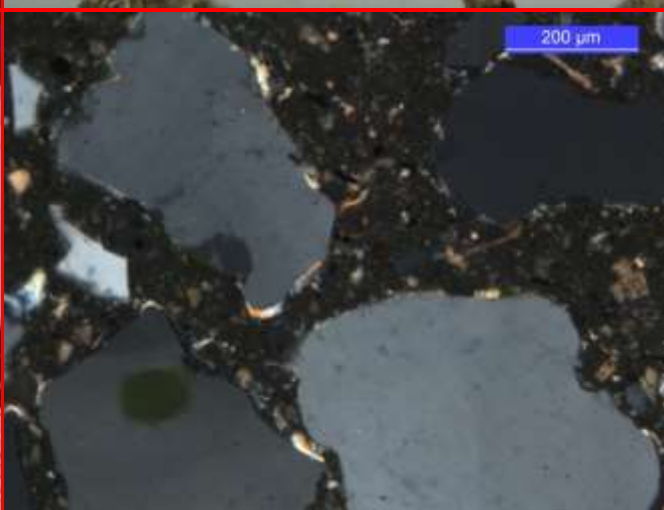
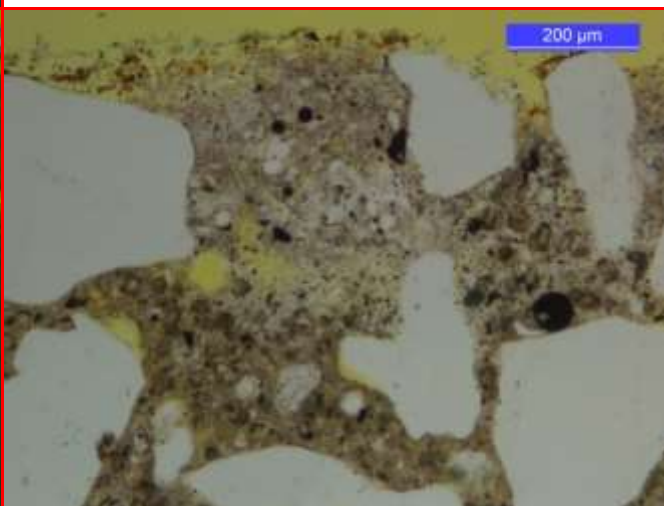
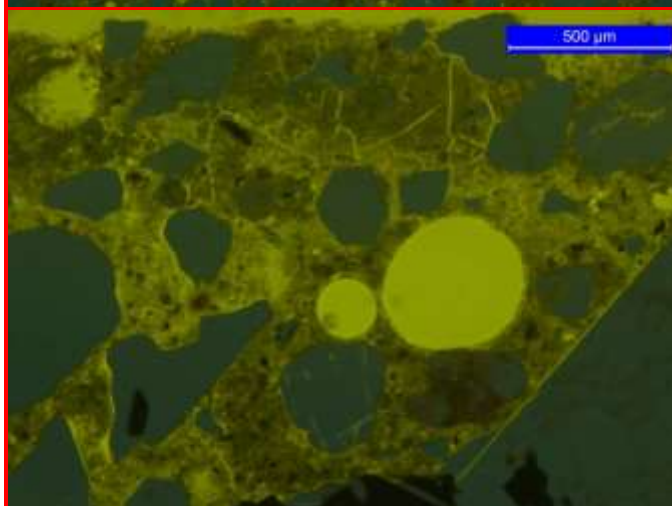
Femern G; CEM I, 12%FA, 4%MS, w/c 0.40

Age: 6 mth's



Micro-observations (west)

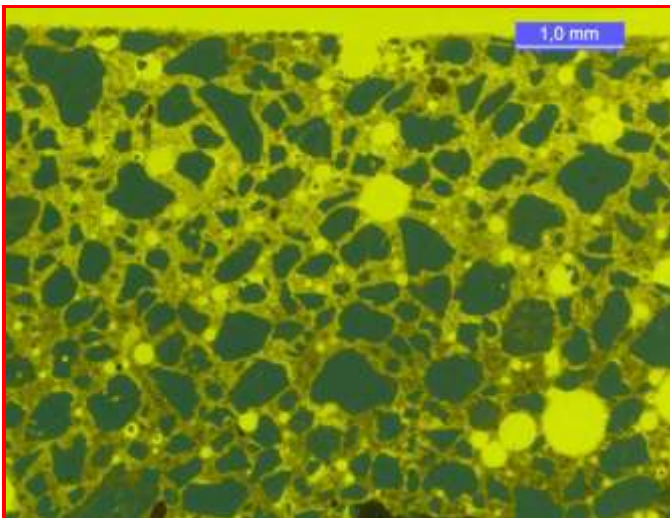
Carbonated paste 0.2-0.6mm, max. 2mm
Popcorn carbonation, calcite crystals in voids
Leached zone beneath carbonation, to 0.8mm
Minor biological growth at uneven surface
Rusty spots present in carbonated zone
Ettringite needles in few air voids of leached zone; to max. 1.5mm
Increased porosity in upper 1mm
Relatively low amount of CH in paste
W/c estimated to about 0.40
Relatively high amount of small, brittle cracks in leached zone; adhesion defects at surface
Generally no cracks in interior paste



Concrete No.:

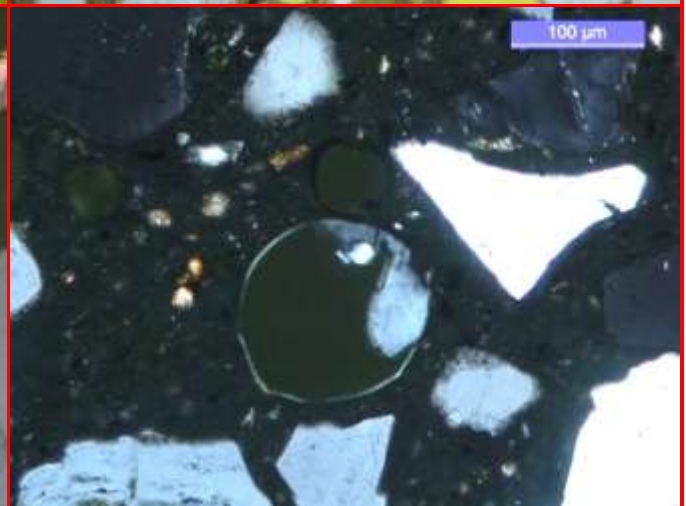
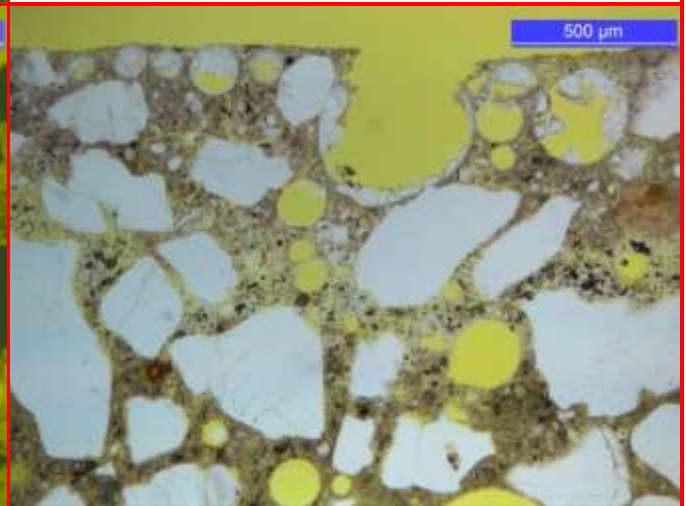
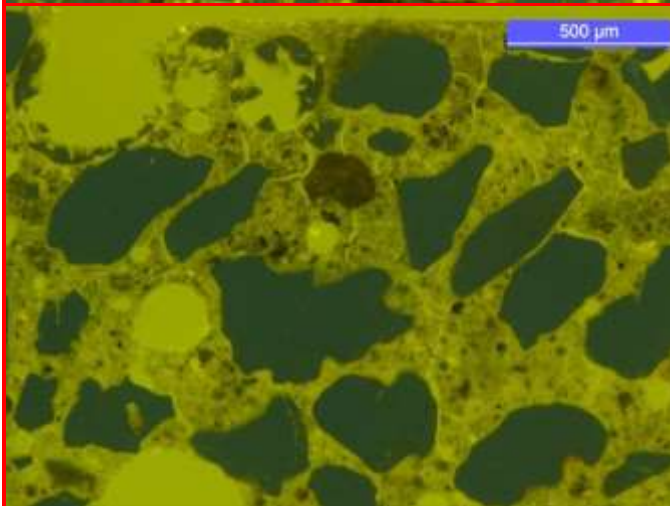
Femern H; CEM I, 12%FA, 4%MS, w/c 0.45

Age: 6 mth's



Micro-observations (west)

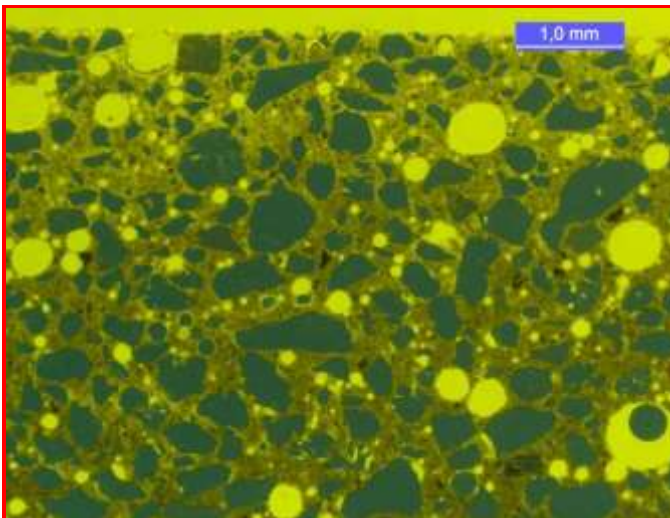
Carbonated paste 0.2-0.4mm, max. 1.2mm
Popcorn carbonation, calcite crystals in voids
Leached zone beneath carbonation, to 2.3mm
Minor biological growth at uneven surface
Rusty spots present in carbonated zone
Ettringite needles in few air voids of leached zone;
to max. 2.5mm (gypsum in voids)
Increased porosity in upper 2mm
Well distributed CH in paste
W/c estimated to about 0.40
Popcorn/porous zone contains many small brittle cracks.
Generally no cracks in interior paste



Concrete No.:

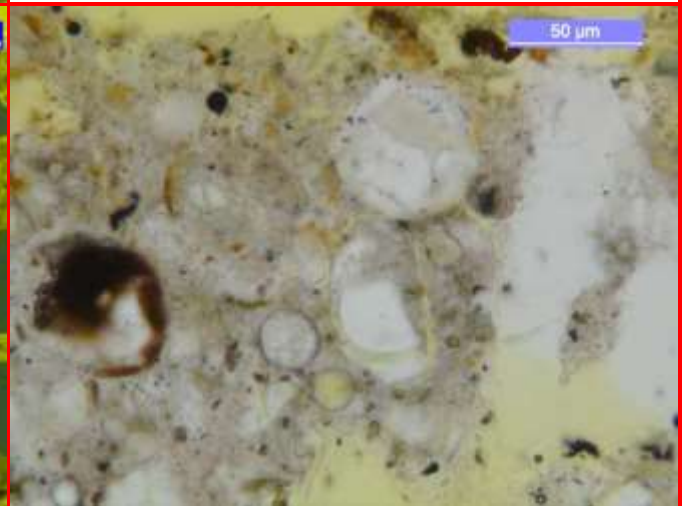
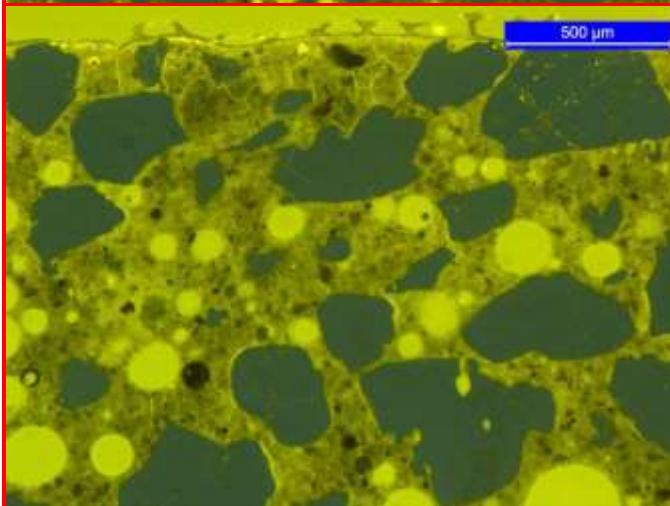
Femern I; CEM I, 12%FA, 4%MS, w/c 0.35

Age: 6 mth's

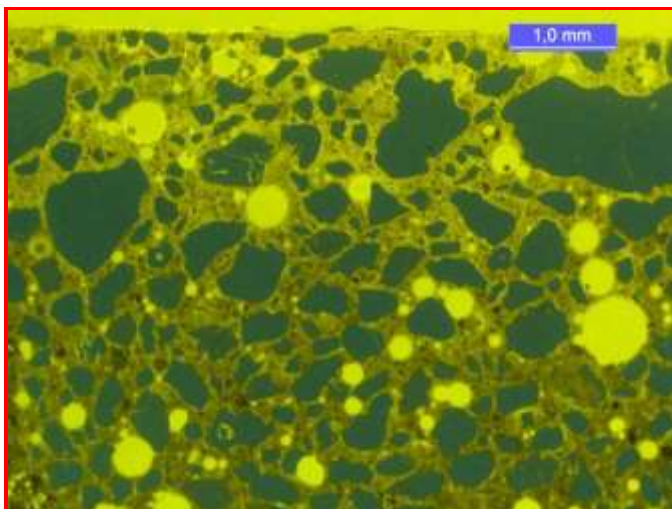


Micro-observations (west)

Calcite crust at surface
Carbonated paste (popcorn) to 0.2mm, max. 3.5mm
Large calcite crystals in voids of carbonated zone
Rusty spots present in carbonated zone
Leached zone beneath carbonation, to 2mm
Ettringite and gypsum in air voids of leached zone.
Calcite popcorn beneath leached zone
Increased porosity in upper 2mm
Relatively large CH crystals in interior paste and in adhesion defects
W/c estimated to about 0.40
Popcorn/porous zone contains many small brittle cracks.
Generally no cracks in paste

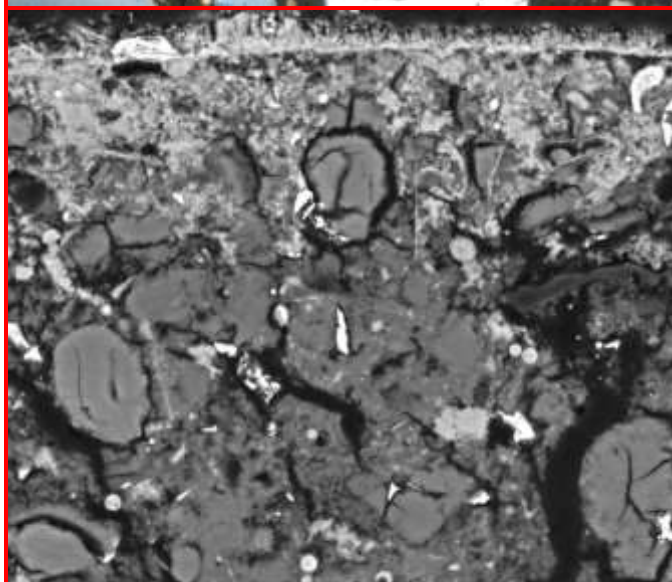
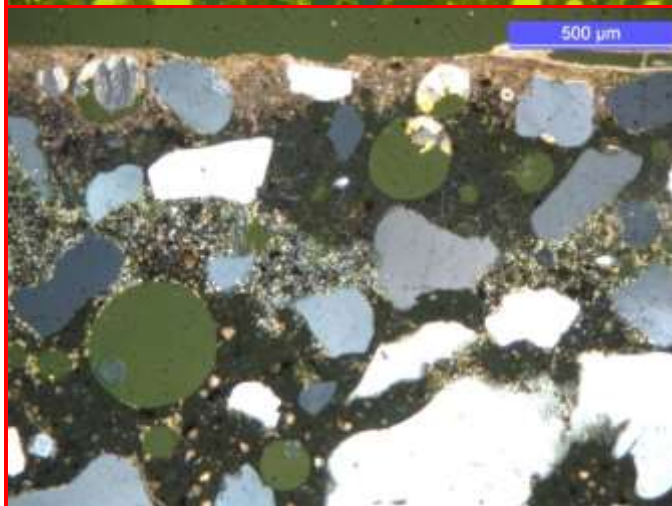


Concrete No.: Femern J; SCC, CEM I, 12%FA, 4%MS, w/c 0.40 Age: 6 mth's



Micro-observations (west)

Calcite crust at surface
Carbonated paste (popcorn) to 0.12-0.2mm, max. 1.5mm
Large calcite crystals in voids of carbonated zone
Rusty spots present in carbonated zone
Leached zone beneath carbonation, to 2.4mm
Ettringite and gypsum in air voids of leached zone.
Calcite popcorn beneath leached zone
Increased porosity in upper 2mm
Relatively large CH crystals in interior paste and in adhesion defects
W/c estimated to about 0.40
Popcorn/porous zone contains many small brittle cracks.
Generally no cracks in interior paste

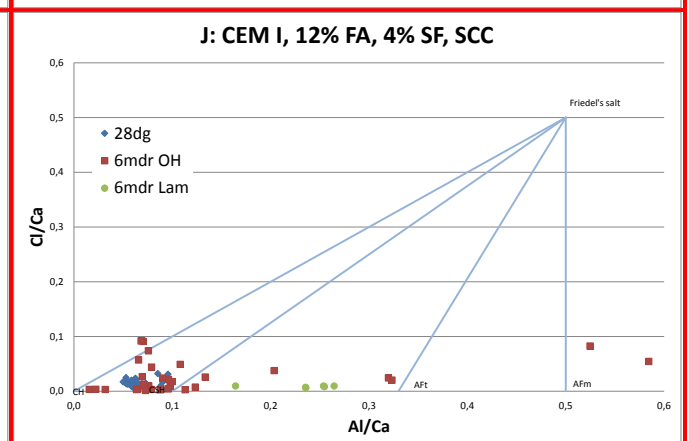
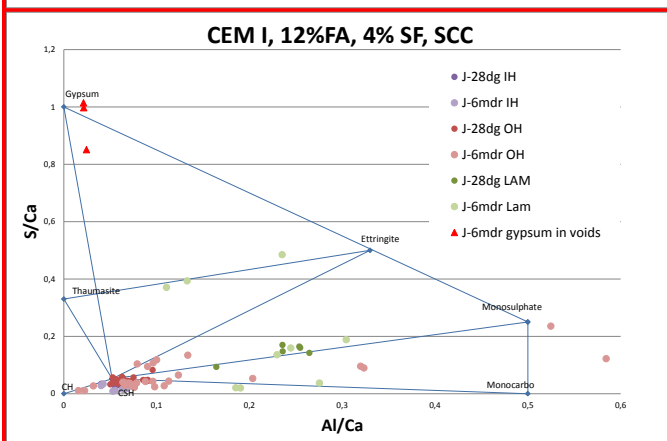
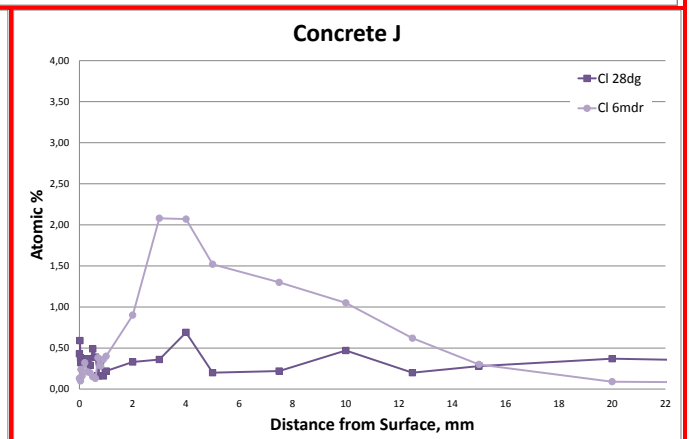
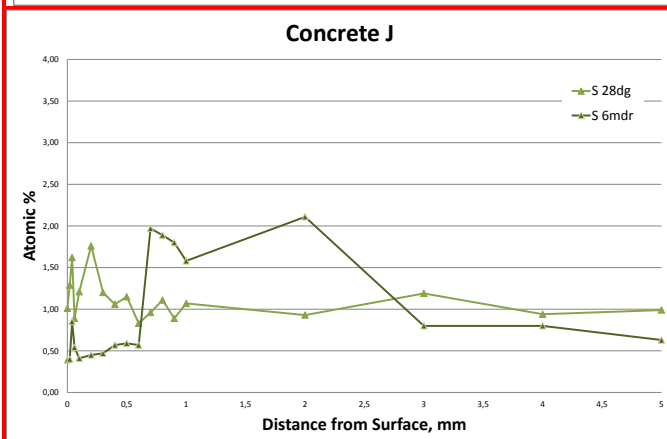
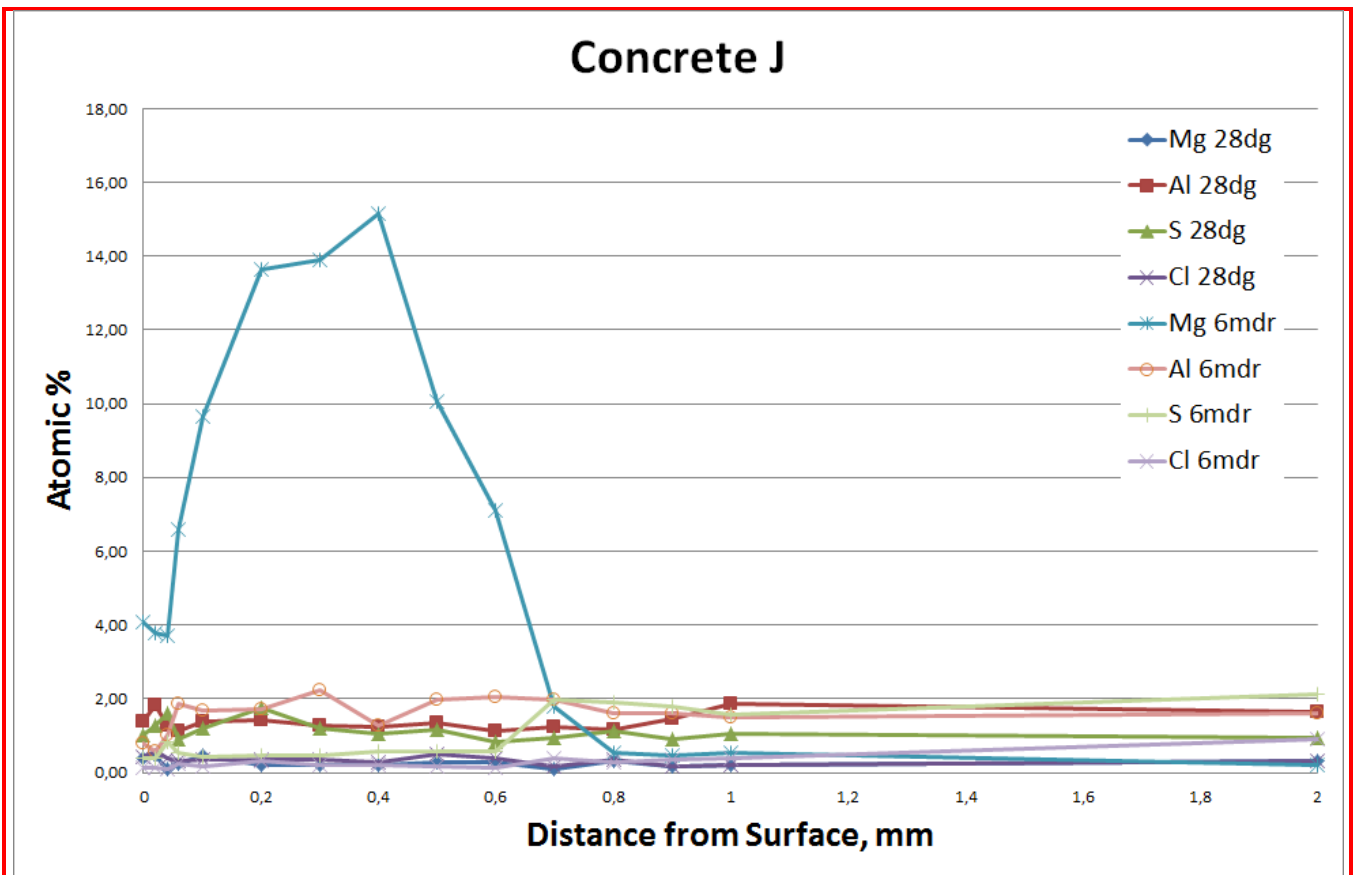


5/3/2011 HFW HV mag WD spot
10:47:24 AM 176 µm 20.00 kV 1 700 x 7.6 mm 5.0

5/3/2011 HFW HV mag WD spot
12:21:57 PM 99.6 µm 20.00 kV 2 997 x 7.6 mm 5.0

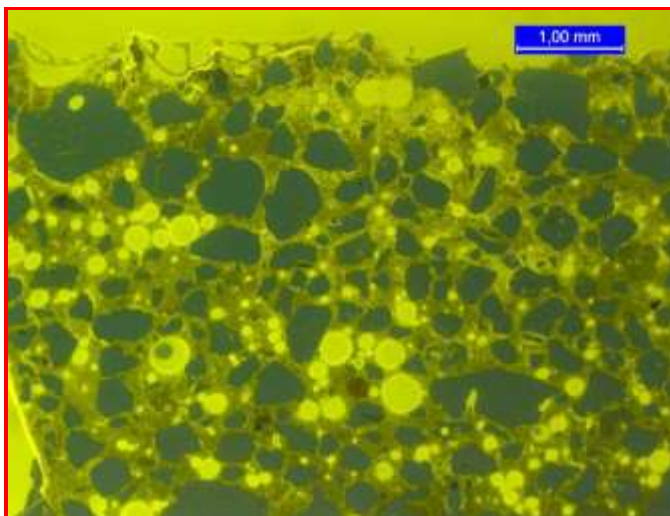


Concrete No.: Femern J; SCC, CEM I, 12%FA, 4%MS, w/c 0.40 Age: 6 mth's



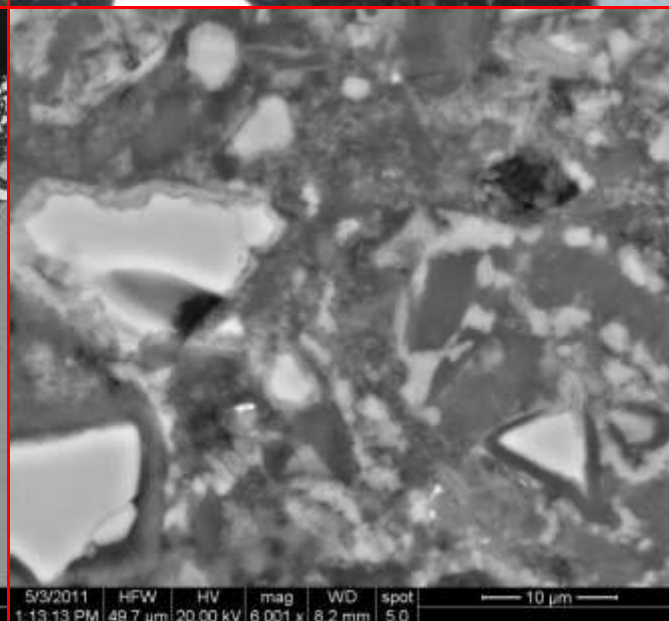
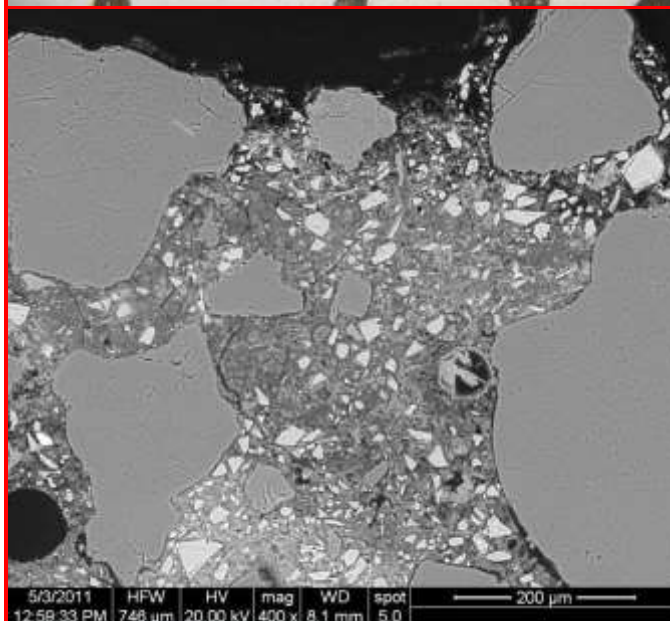
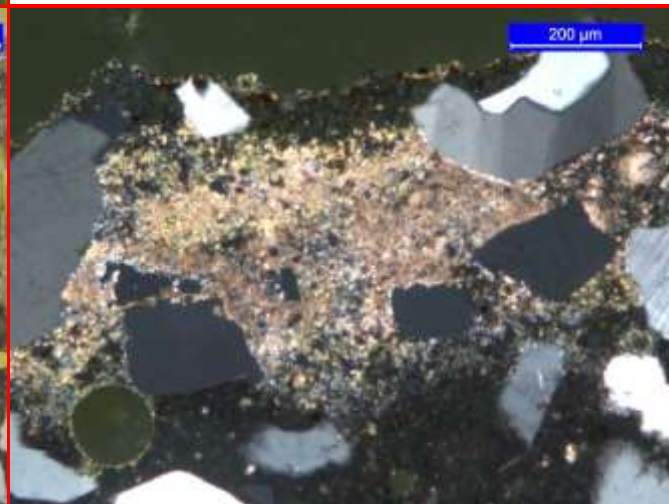
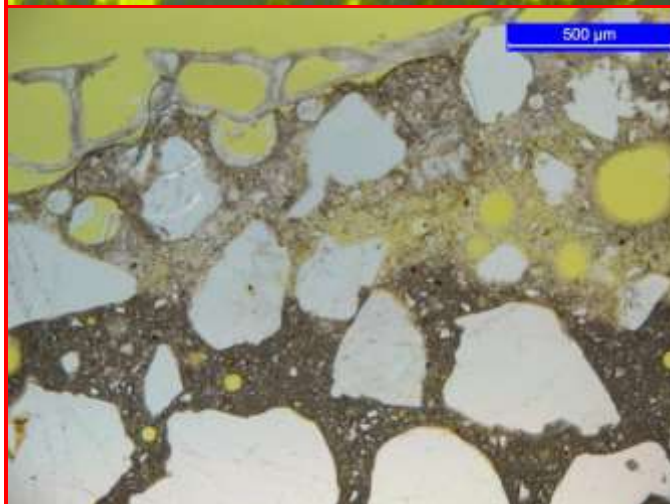
Concrete No.: Femern K; CemIII/B, w/c 0.40

Age: 6 mth's



Micro-observations (west)

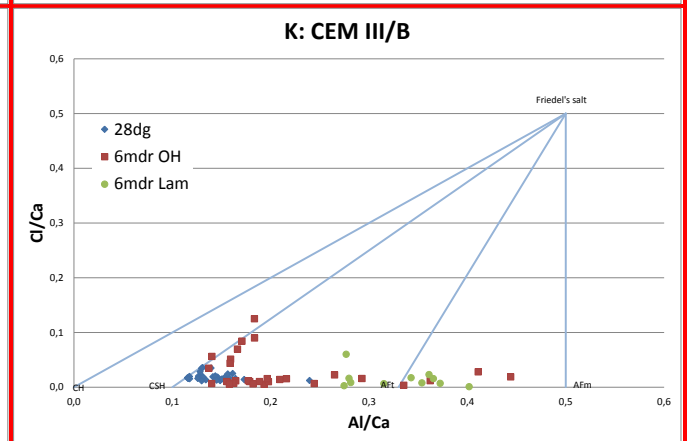
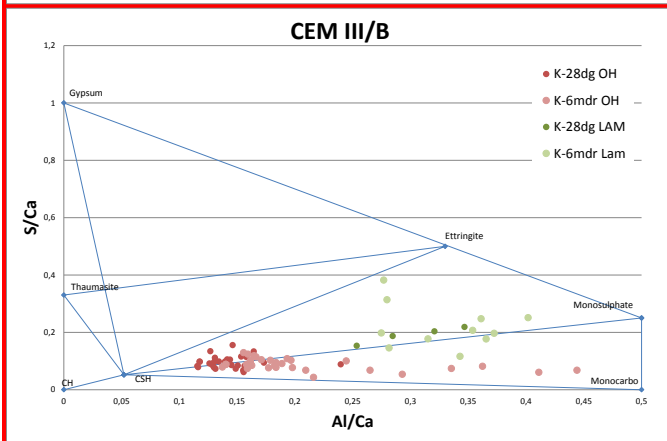
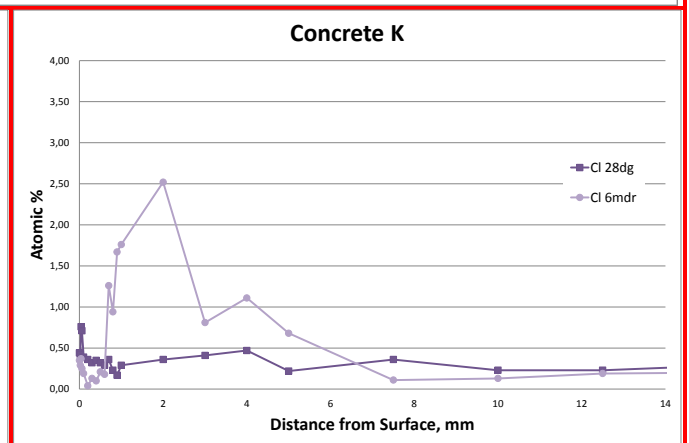
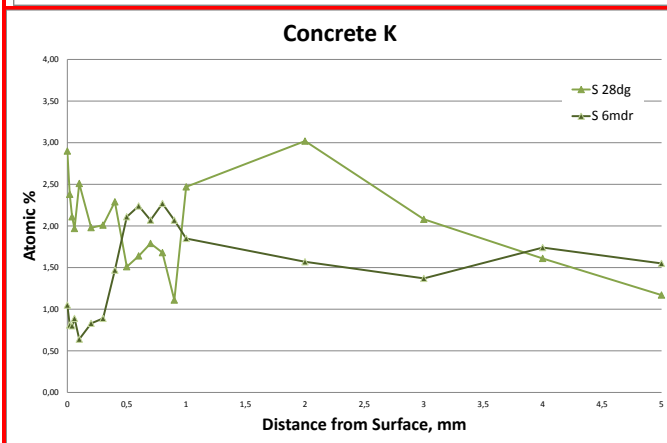
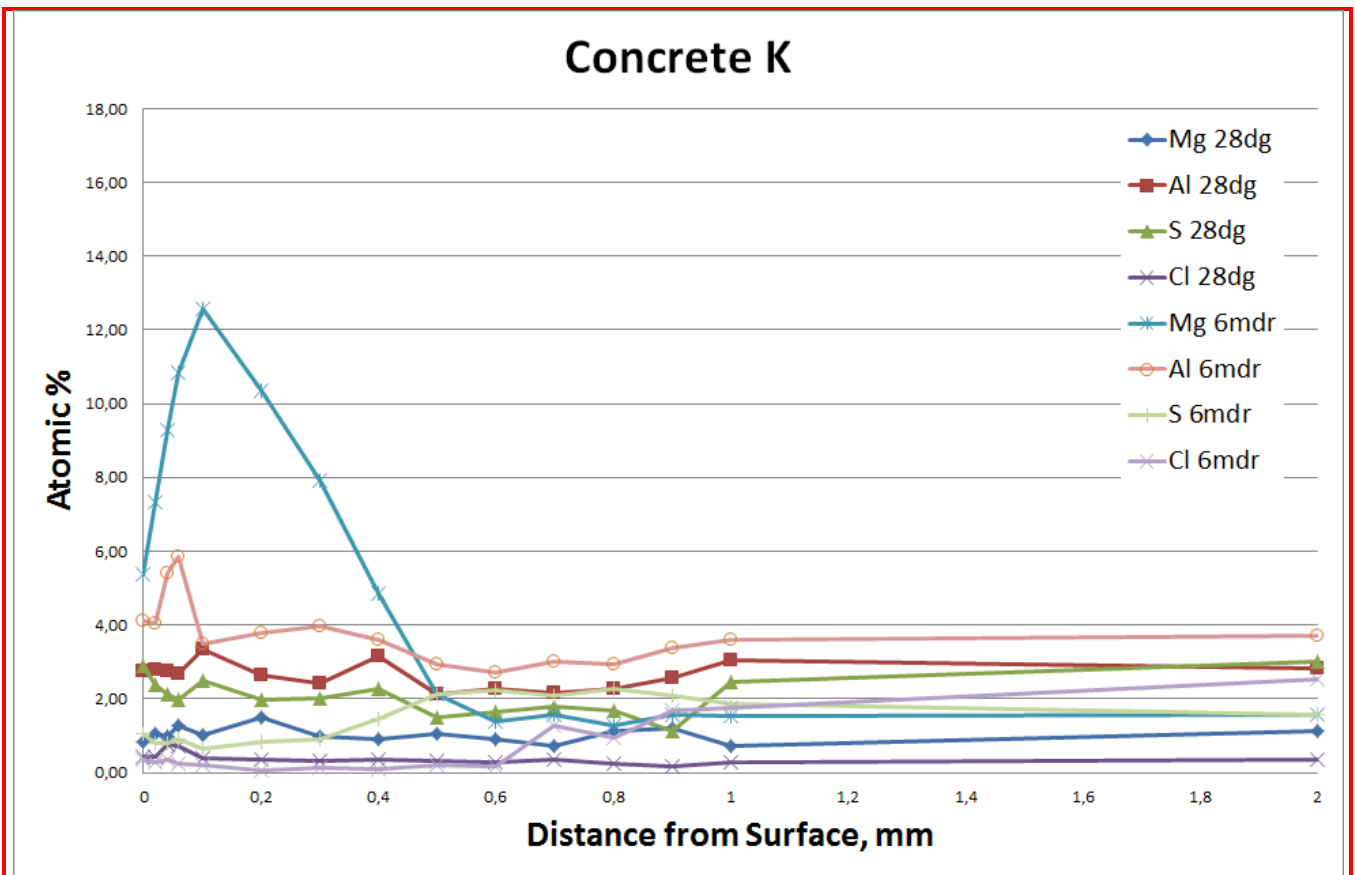
Somewhat uneven surface partly with calcite crust partly with biological growth. Paste below biological growth appears black (leached). Carbonated paste (popcorn) to 0,4-1mm. Large calcite crystals in voids of carbonated zone. Increased porosity in outer 1.2mm. Paste appears homogeneous, opaline and black (CH invisible). W/c estimated to about 0.40, slightly increasing towards surface. Popcorn/porous zone contains many small brittle cracks. Generally no cracks in interior paste. Somewhat unevenly distributed air, 4-5%.





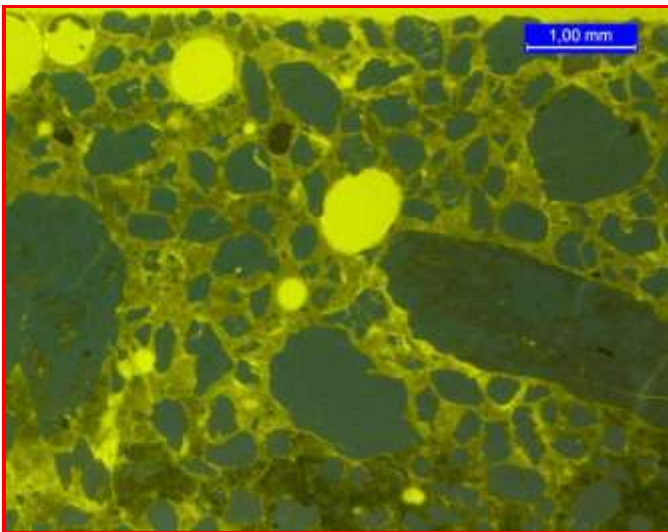
Concrete No.: Femern K; CemIII/B, w/c 0.40

Age: 6 mth's



Concrete No.: Femern L; CemIII/B, w/c 0.40

Age: 6 mth's



Micro-observations (west)

Weathered surface with exposed sand grains and biological growth. Paste below biological growth appears black (leached).

Carbonated paste (popcorn) to 0.4-0.6mm. Large calcite crystals in voids of carbonated zone

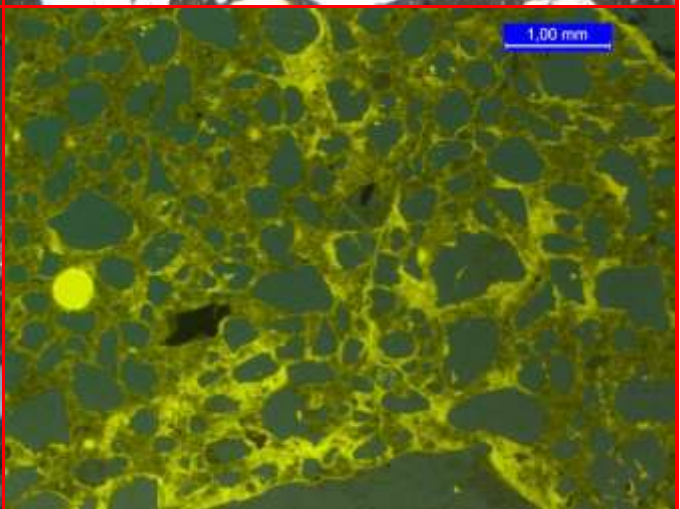
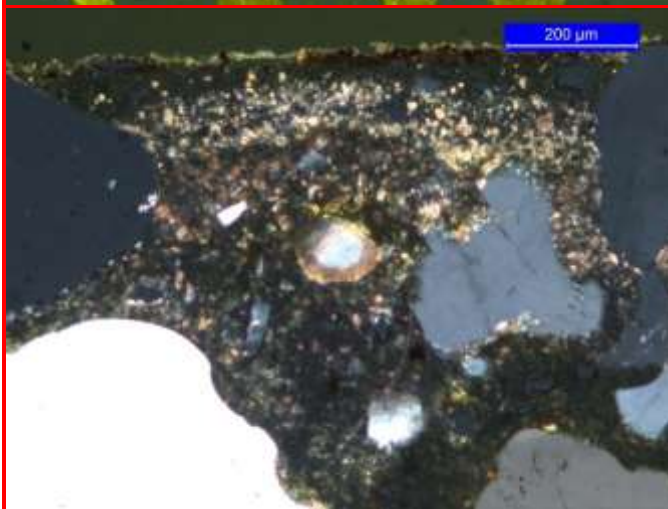
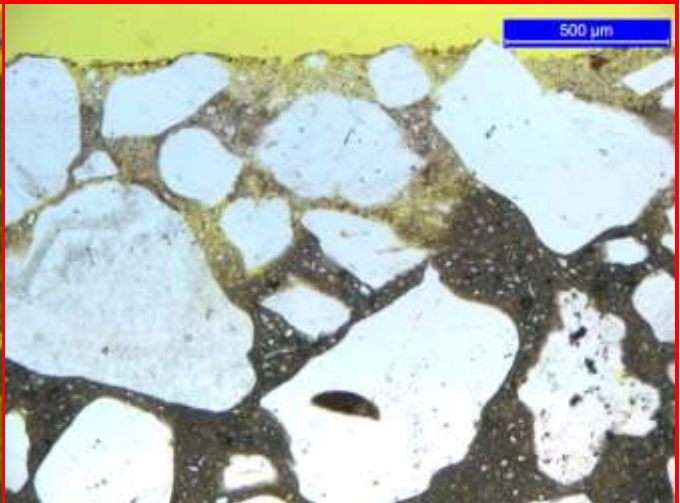
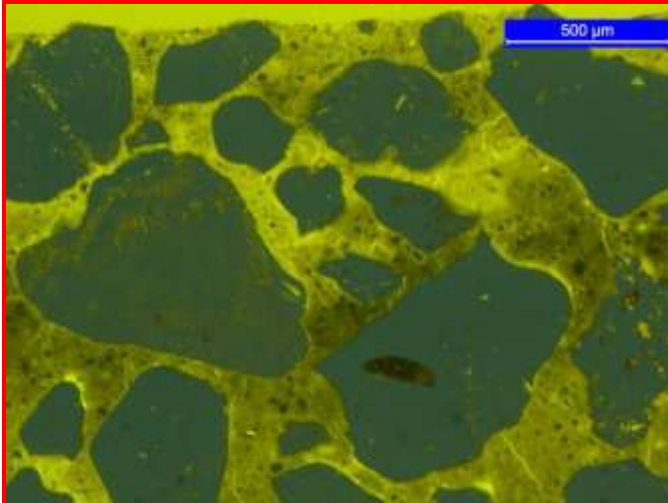
Increased porosity in outer 0.6-1.2mm (5mm)

Paste appears rather inhomogeneous, opaline and black (CH invisible)

W/c estimated to about 0.40, increasing towards surface

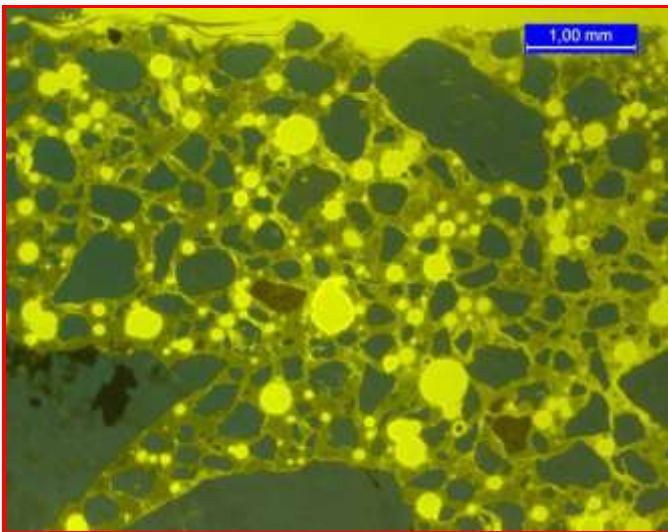
Popcorn/porous zone contains some small brittle cracks as well as many small plastic defects

Many plastic paste defects are generally present Few air voids are present



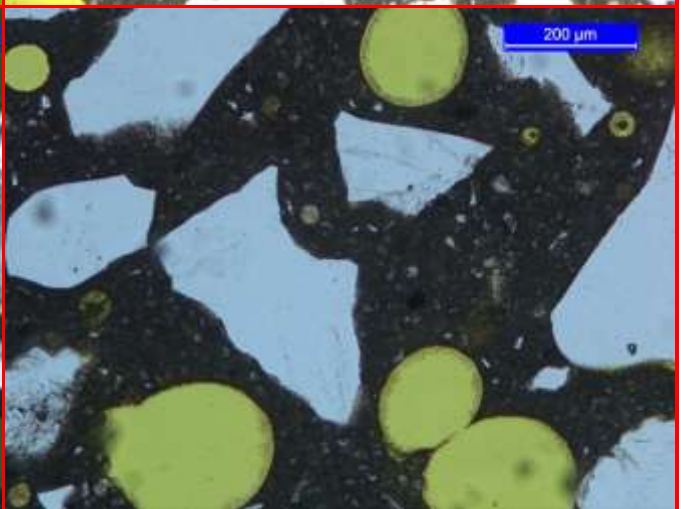
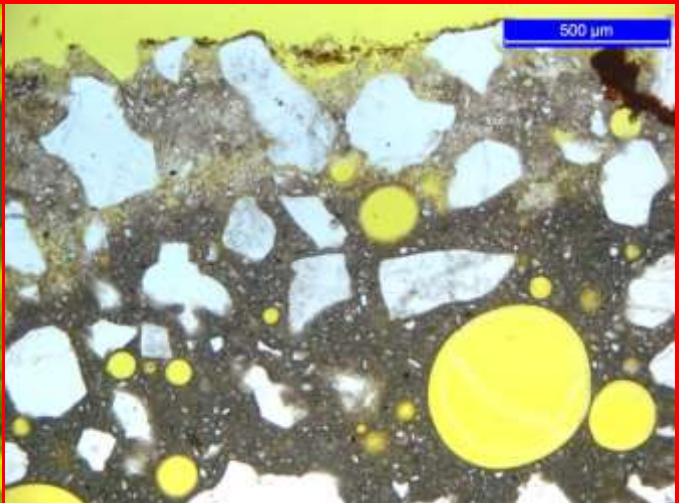
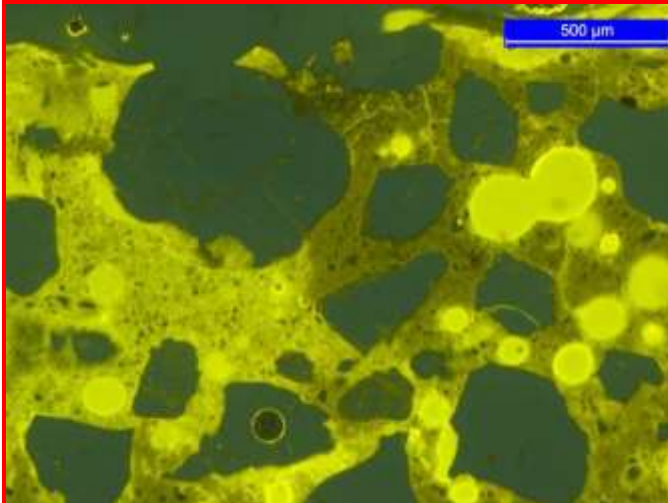
Concrete No.: Femern M; SCC, CemIII/B, w/c 0.40

Age: 6 mth's



Micro-observations (west)

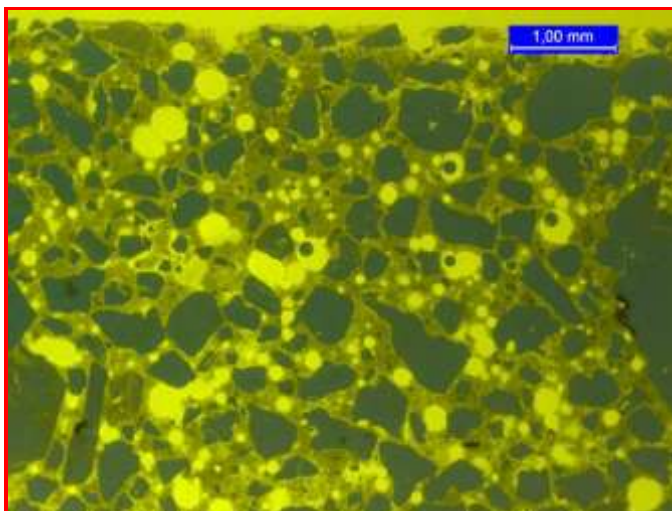
Somewhat uneven surface partly with calcite crust partly weathered with biological growth. Paste below biological growth appears black (leached). Carbonated paste (popcorn) to 0.4-1.2mm. Large calcite crystals in voids of carbonated zone. Increased porosity in outer 0.6-1.2mm. Paste appears relative homogeneous, opaline and black (CH invisible). W/c estimated to about 0.40, slightly increased in areas of air void clusters. Popcorn/porous zone contains few small brittle cracks. Ettringite needles in voids in outer 2mm. Some adhesion cracks in interior paste. Somewhat unevenly distributed air, 5-6%.



Concrete No.:

Femern N; CemI 52,5N, 70%slag, w/c 0.40

Age: 6 mth's



Micro-observations (west)

Partially weathered surface with biological growth. Paste below biological growth appears black (leached).

Carbonated paste (popcorn) to 0.4-0.8mm. Large calcite crystals in voids of carbonated zone

Increased porosity in outer 0.8mm

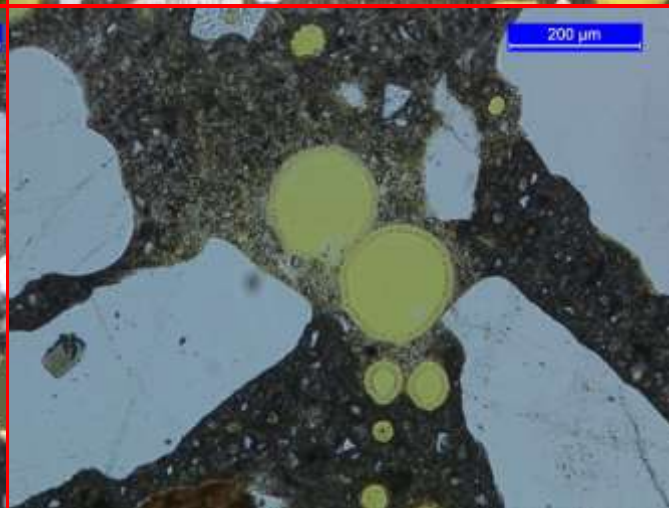
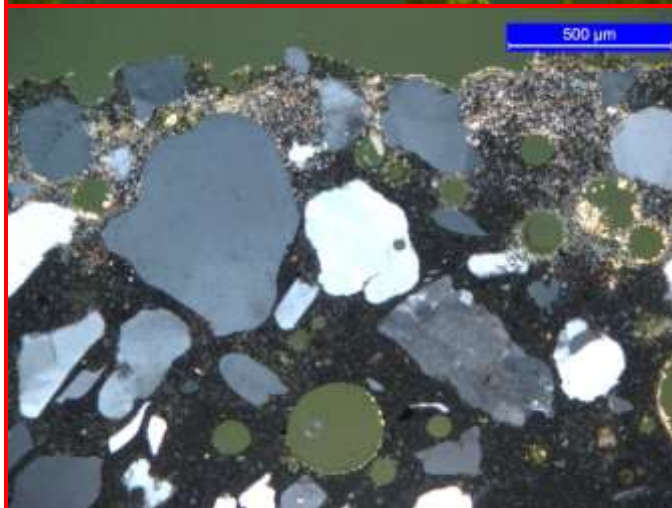
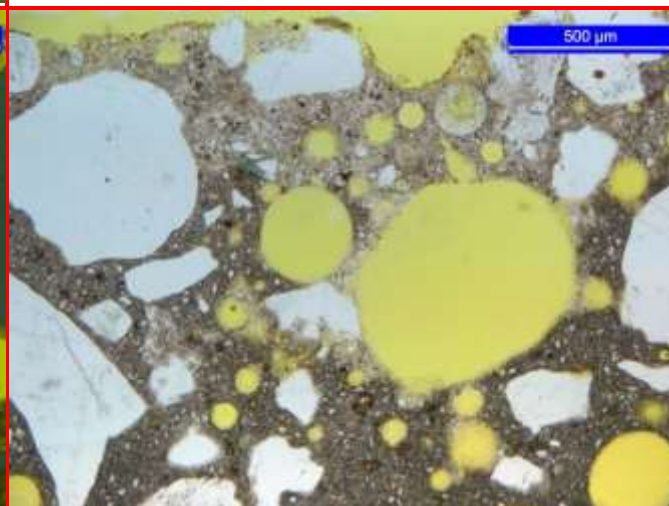
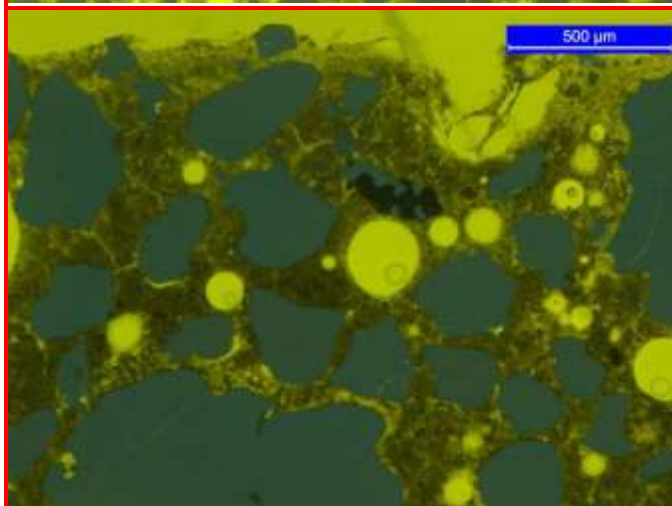
Paste appears relative homogeneous, opaline and black (CH invisible)

W/c estimated to about 0.40, slightly increased in areas of air void clusters

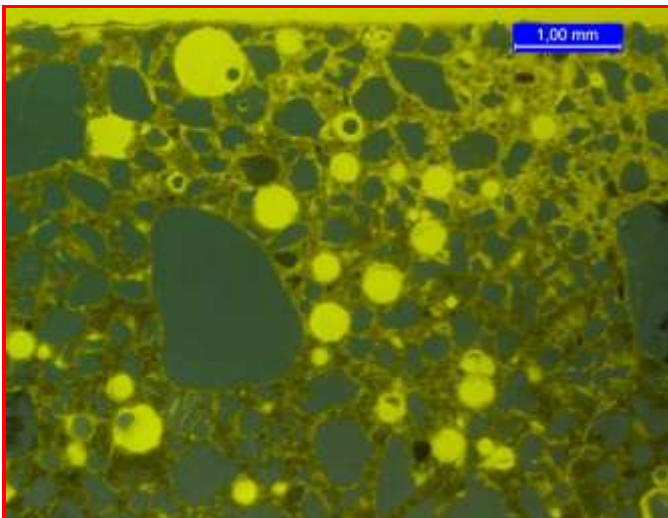
Popcorn/porous zone contains few small brittle cracks. Ettringite needles in voids in outer 2mm.

Few cracks in interior paste

Somewhat unevenly distributed air, 4-5%



Concrete No.: Femern O; CEM III, 4%MS, w/c 0.40, polymers Age: 6 mth's



Micro-observations (west)

Plane, relative intact surface, occasionally with calcite crust. Carbonated paste 0.2mm. Popcorn carbonation, calcite crystals in voids to 2mm.

Leached zone beneath carbonation, max. 2mm

Minor biological growth at uneven surface

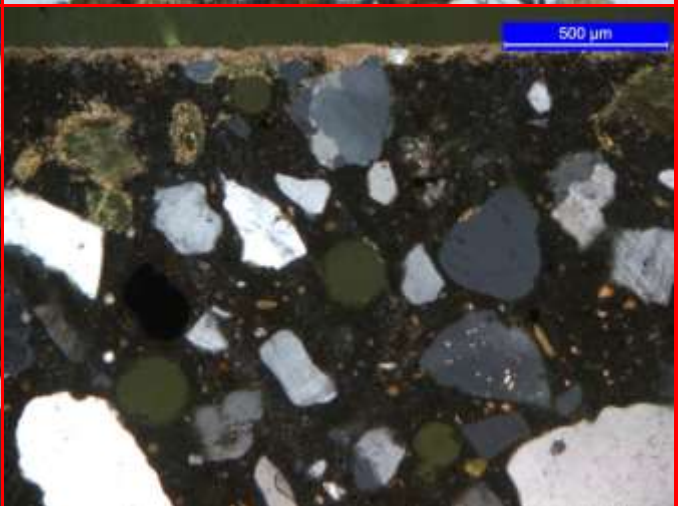
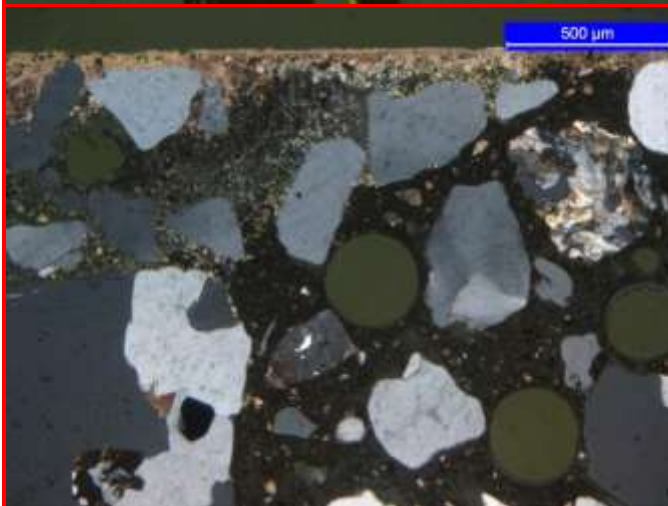
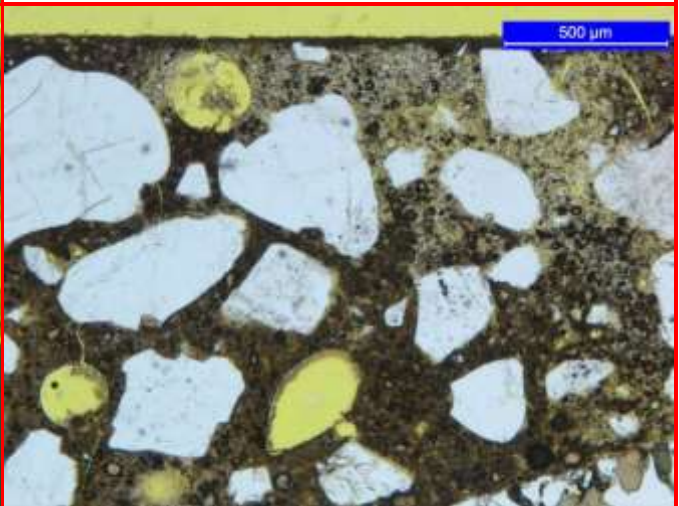
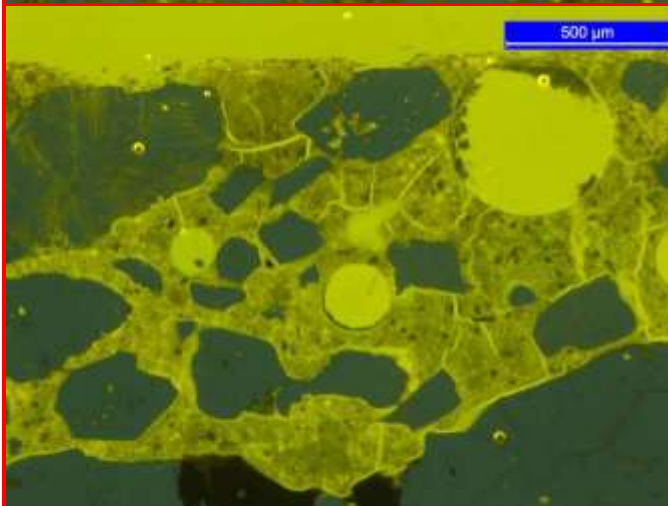
Increased porosity in upper 2mm

W/c estimated to about 0.40

Relatively dark paste with CH in adhesion zones
Relatively high amount of small, brittle cracks in porous zone, fine cracks to 2.5mm and some adhesion cracks.

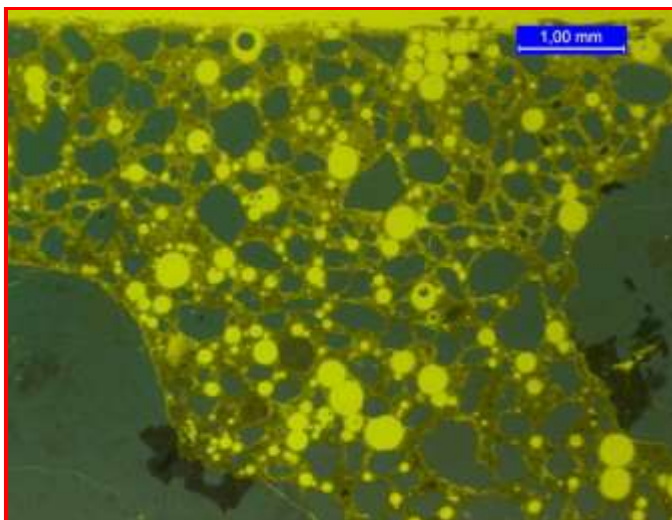
Generally no cracks in interior paste

Ettringite needles in few air voids of leached zone; to max. 2mm



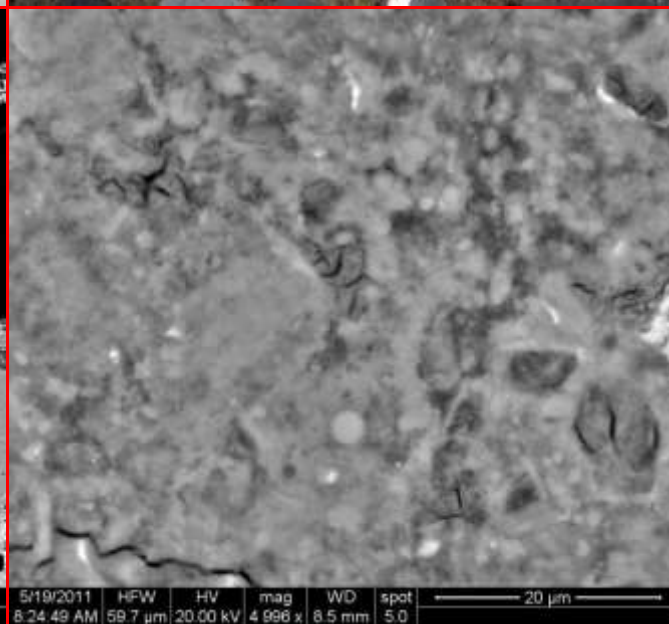
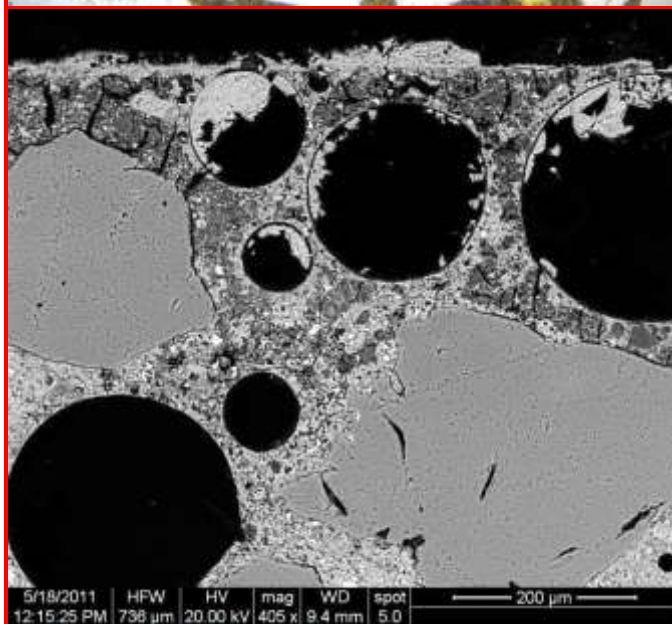
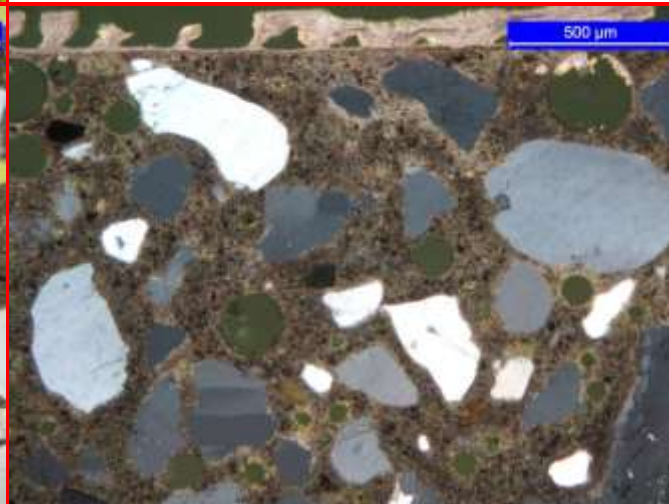
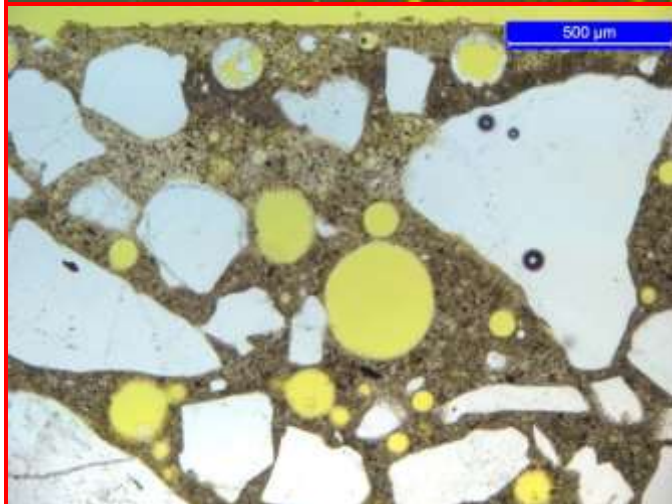
Concrete No.: Femern Basis; CemII

Age: 6 mth's



Micro-observations (core)

Intact surface occasionally with calcite crust
Carbonated paste to 0.1, max 1mm. Difficult to observe due to lime fine content.
Large calcite crystals in voids of carbonated zone
Leached zone beneath carbonation, to 1mm
Porous surface to max 0.6mm (layering)
Ettringite and gypsum in air voids of leached zone.
Increased porosity in upper 1mm
CH difficult to observe due to lime fines
W/c estimated to about 0.40
Brittle cracking in porous/leached surface zone
Generally no cracks in paste

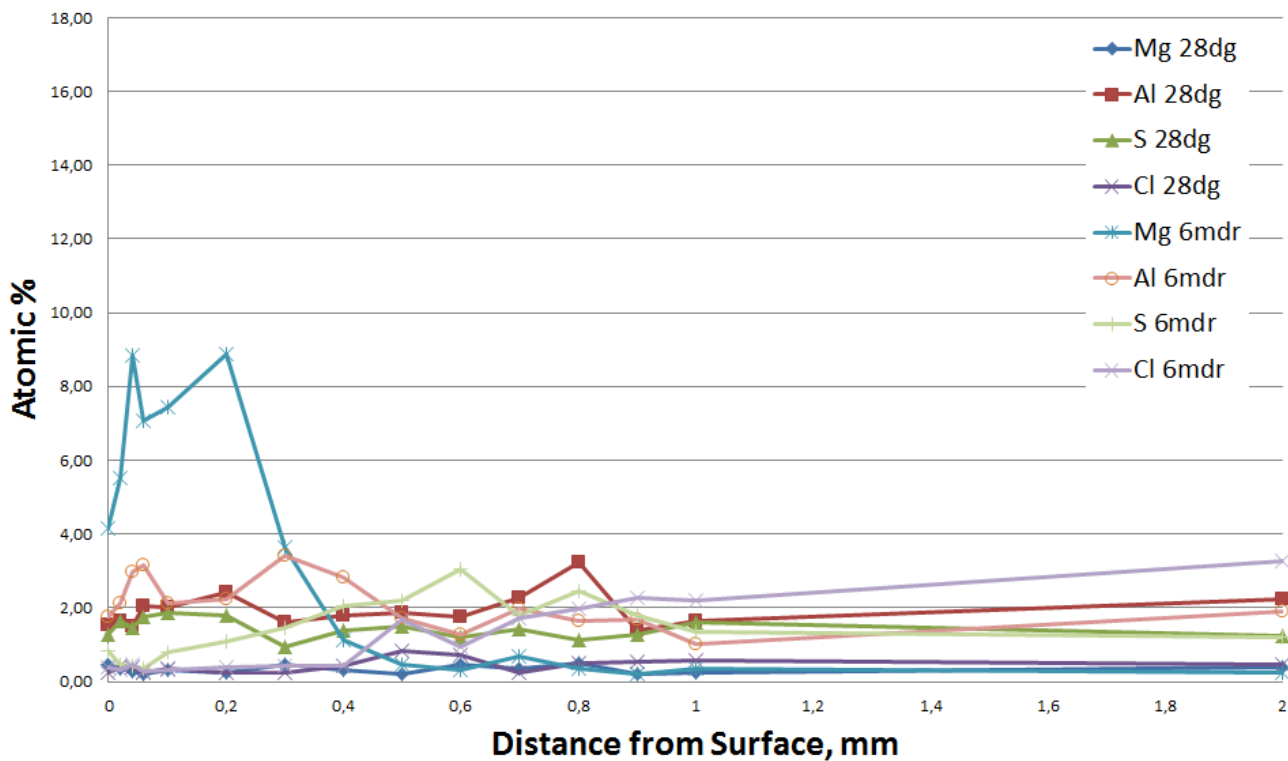




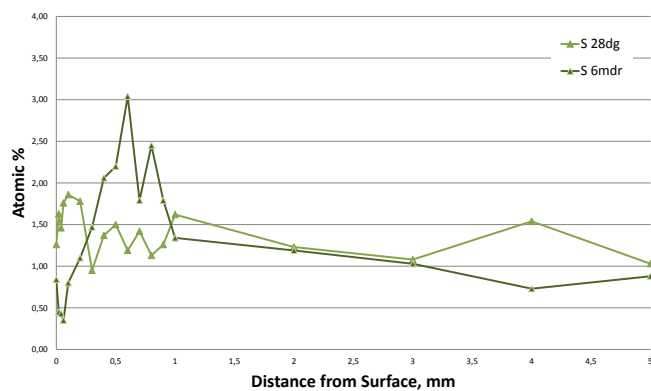
Concrete No.: Femern Basis; CemII

Age: 6 mth's

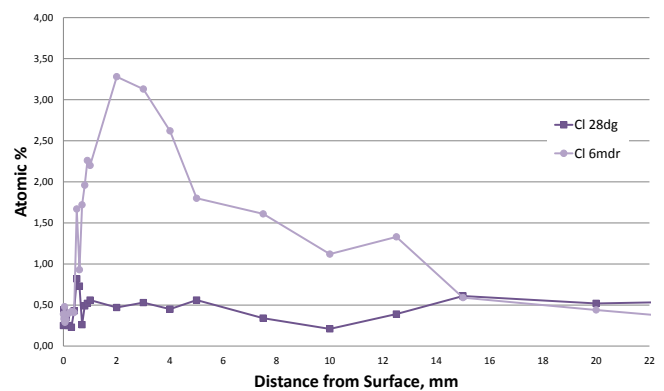
Concrete Basis



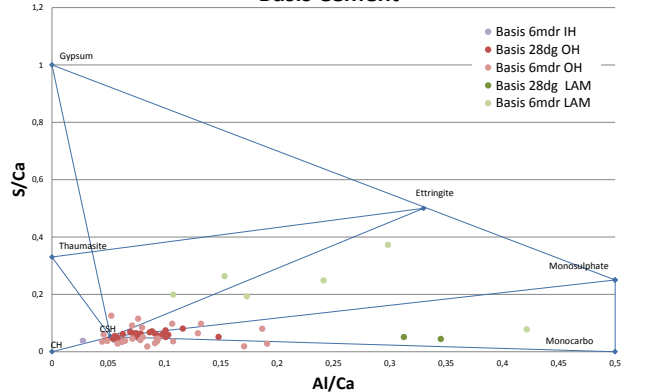
Concrete Basis



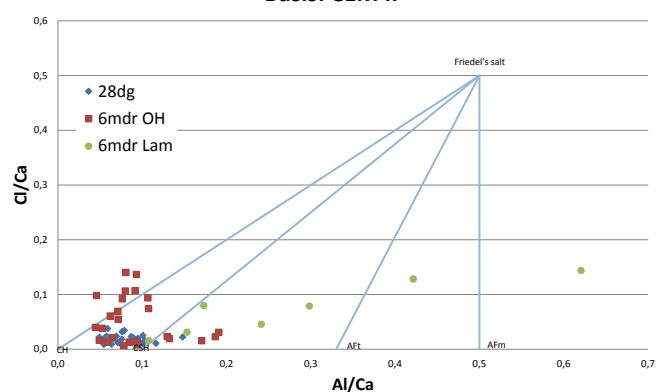
Concrete Basis



Basis Cement

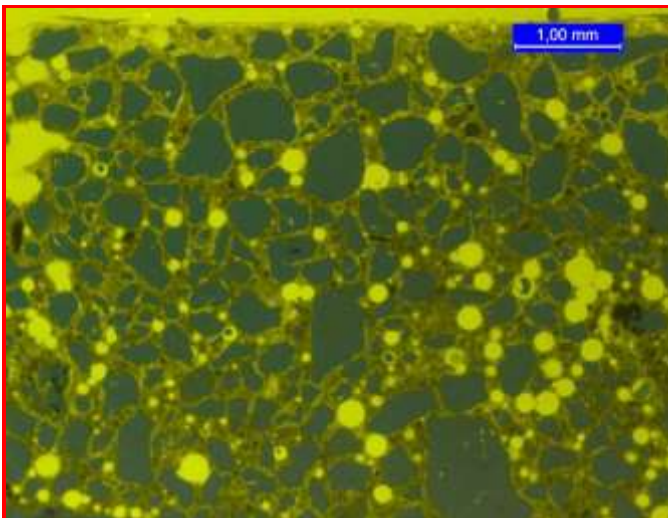


Basis: CEM II



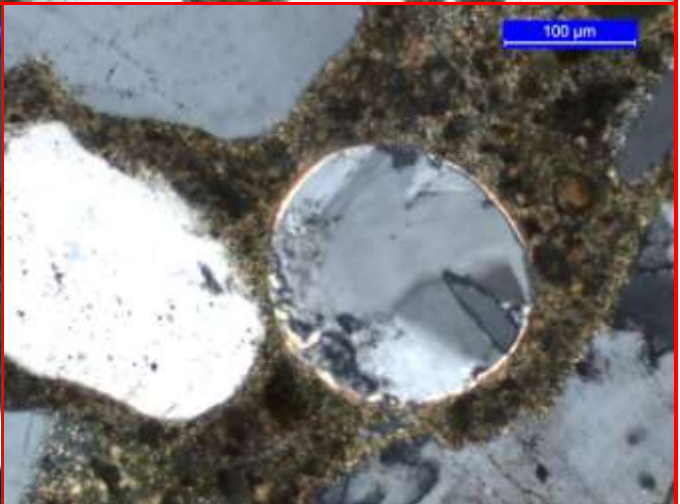
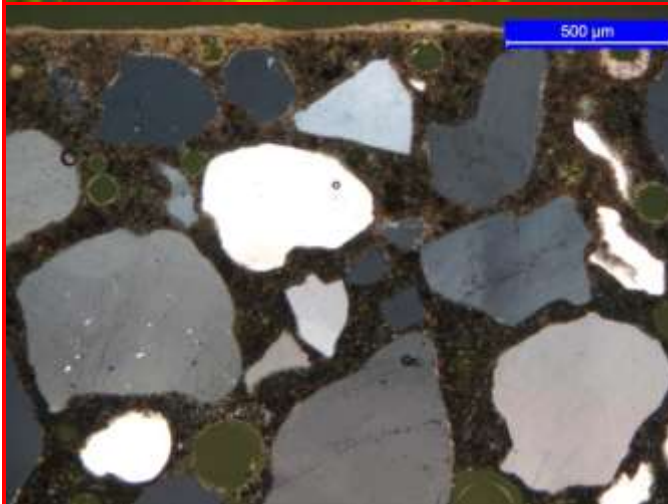
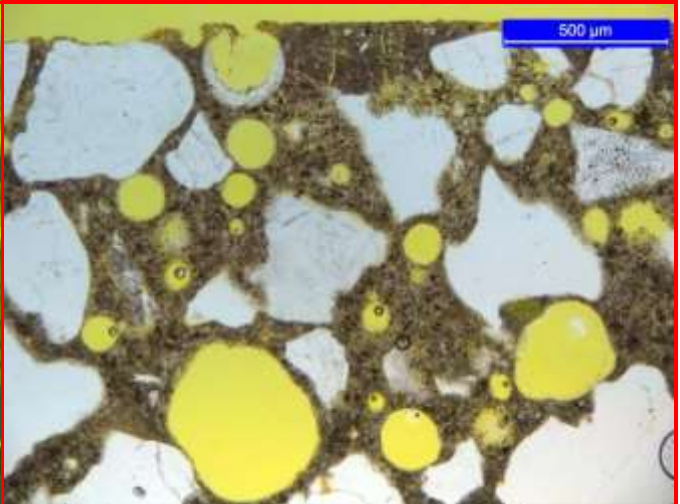
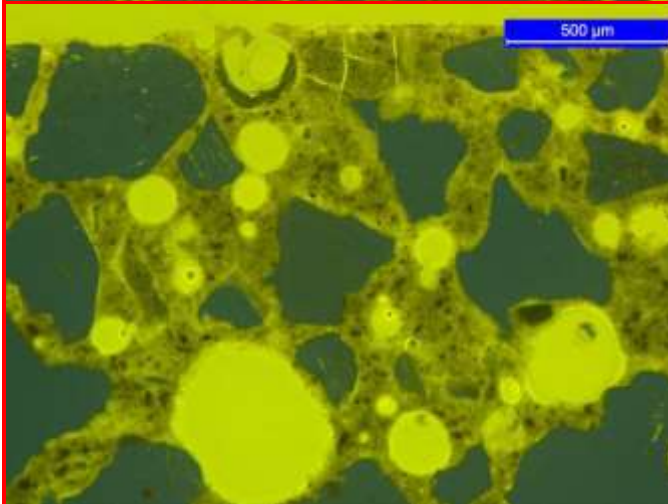
Concrete No.: Femern Rapid; CEM I

Age: 6 mth's



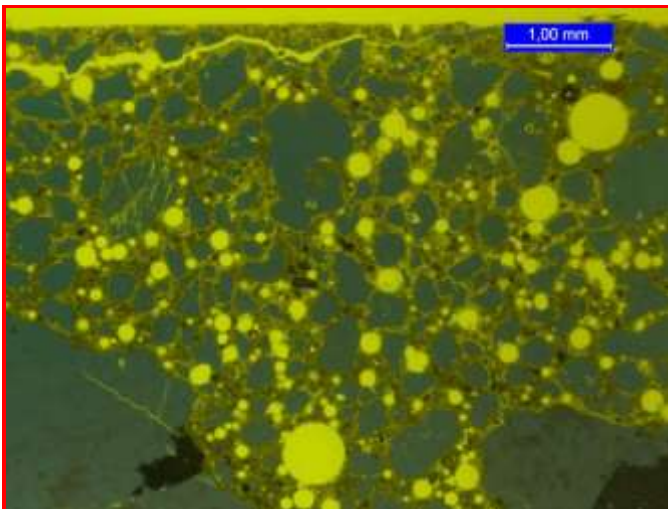
Micro-observations

Plane, relative intact surface, occasionally with calcite crust or biological growth
 Carbonated paste 0.6-1.2mm.
 Leached zone beneath carbonation, 0.4-0.6mm thick
 Increased porosity in upper 1mm
 W/c estimated to about 0.40
 Relatively dark paste with CH in adhesion zones
 Some small, brittle cracks in upper 0,3mm of porous zone
 Generally no cracks in interior paste
 Well distributed air void system, est. to 5-6%.
 Ettringite needles observed in voids throughout section.
 Gypsum observed in air void in leached surface zone.



Concrete No.: Femern Rapid; CEM I+FA

Age: 6 mth's



Micro-observations

Relative intact surface with biological growth
Carbonated paste 0.4mm. Calcite crystals in voids of carbonated surface.
Leached zone beneath carbonation to 2mm
Increased porosity in upper 0.4mm
W/c estimated to about 0.40
Relatively dark paste with CH in adhesion zones
Some small, brittle cracks in porous zone, upper 0,4mm. A surface parallel cracks appears 0.4mm under the surface (wavy pattern)
Generally no cracks in interior paste
Relatively well distributed air void system, est. to 5-6%. Ettringite needles observed in voids throughout section.

