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Ceramic Building Materials of Velia

Description of observed fabrics

The five types distinguished by microscopic analysis are based upon one petrographical-mineralogical type (RVZ01) with its subtypes RVZ01a and RVZ01b. The fabrics show the characteristics generally observed with all Velinian fabrics, consisting of the lack of any carbonatic inclusions or carbonate-pseudomorphoses, quartz and red iron oxide concretions and differ from each other by color of the matrix, sorting of the temper and size of inclusions.

VEL-CBM-1

Reference sample: M8/10

The matrix is hard fired and light red (2.5YR6/8), the fraction irregular. The fabric is characterized by a very inhomogeneous size of the contained particles, ranging from very small to large, most important being all sorts of quartz and a certain amount of iron-oxide-concretions, visible as rust colored or dark gray particles.

VEL-CBM-2

Reference sample: M8/7; Further samples: M8/17

The matrix is hard fired and yellowish red (5YR5/6), the fraction irregular. It differs from VEL-CBM-1 only by its better “sorting” of particles.

VEL-CBM-3

Reference sample: M8/5

The fabric shows a finer grained yellowish red matrix (7.5YR6/6) together with a lower degree of temper than the foregoing fabrics. The temper consists of fine white quartz grains, numerous gray inclusions and sporadic very large reddish brown particles.

VEL-CBM-4

Reference sample: M8/48; Further samples: M8/47; M8/49

The fabric shows a darker yellowish red (5YR5/6) and hard fired matrix, the fraction is irregular, the sorting of the temper is unsorted and consists of numerous fine to medium-sized white particles and many medium-sized to large gray inclusions.

VEL-CBM-5

Reference sample: M8/23; Further samples: M8/18

The matrix is light brown (7.5YR6/4), the fabric is soft. The temper is unsorted, the size of the observed particles is lower, consisting of mostly quartz, and fewer reddish brown and gray particles.

Observed shapes and function

The fabrics were observed with fragments of roof tiles, which belong to the Western Greek system (fig.1), consisting of *tegulae* and *imbrices* (fig.1).[1] The surface of the fragments is covered by a thin white slip or is simply burnished.

The flat, rectangular *tegulae*, measuring approximately 50/55 – 80/83 cm, are characterized by a raised border on the two vertical sides with a diameter of 4 – 5 cm. These raised borders are rounded on top and undercut on the lower surface of their lower part (ca. 12.5 cm in length) in order to overlap with the border of the next tile downwards (fig.2).[2]

With this type of *tegulae* go two types of *imbrices*, with rounded or pentagonal profile (fig.3).[3] Fragments of tiles with large diameter are interpreted as ridge tiles. The roof tiles of the Western Greek system are in Velia observed in late archaic to classical contexts.

(M. Trapichler)

[1] Gassner 2003, 146-51, fig.71, with bibliography.
[2] Gassner 2003, fig.70.
[3] Gassner 2003, fig.73 – 74.

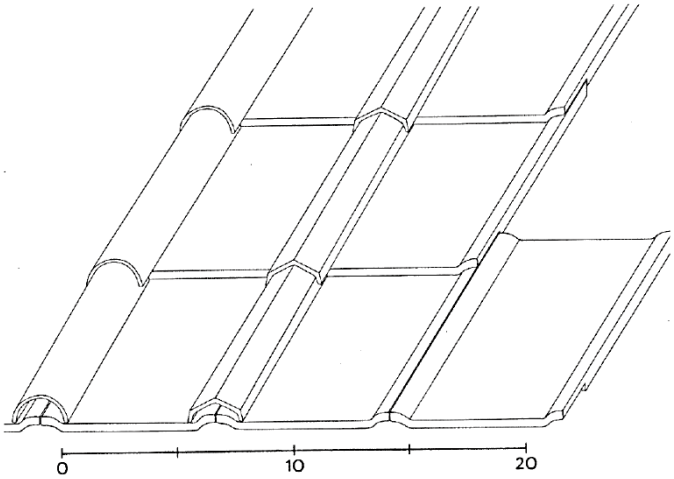

Fig.1. *Tegulae* and *imbrices* of Western Greek system.

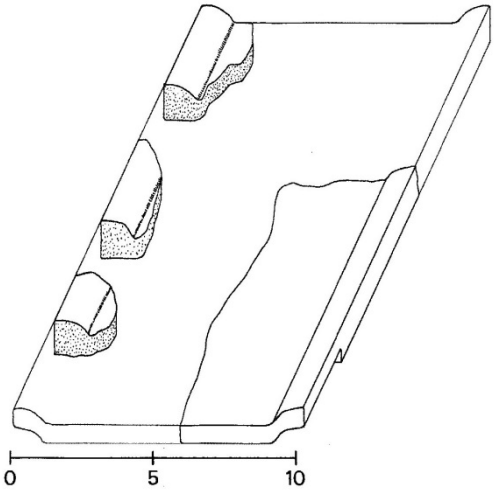

Fig.2. Rectangular *tegula*.

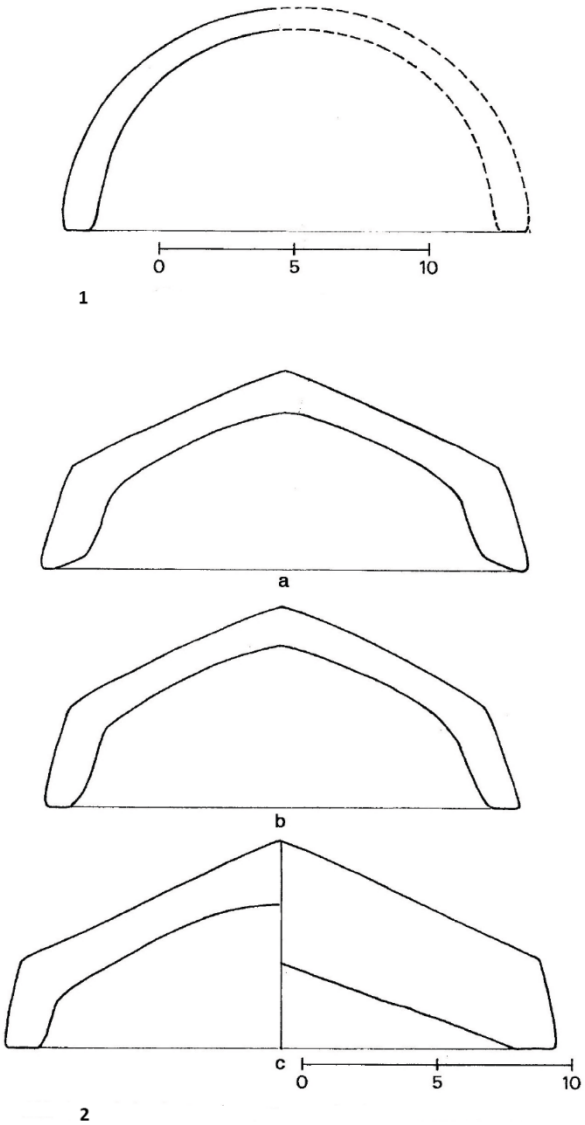

Fig.3. *Imbrices*. 1 Type 2 (Elea, III a.46). 2 Pentagonal profile. 2a (Elea, II b.119). 2b (Elea, III a.48). 2c (Elea b.33).

Petrographic analyses of tiles, bricks and mud bricks from Velia

Numerous samples found in the excavations of Velia have been analyzed. The fired material could be divided into about 14 petrographic fabric types. Based on their petrographical composition and the comparison with local raw materials it was possible to distinguish between locally produced tiles and bricks and imports.[4] In this report only the five petrographic fabric types are presented, where a local Velinian production is proved or very likely.

Petrographic fabric type RVZ01 (pl.1 – 3)

Samples: M7/11; M7/12; M8/5; M8/7; M8/9; M8/23; M8/47; M8/48; M8/49

The fabric type RVZ01 shows an oxidised, reddish brownish groundmass with a very poor sorted temper. The groundmass is micaceous and devoid of carbonates. The groundmass is partially optically active, partly isotropic (depending on the firing temperatures). The average temper content is about 33% (14 – 52%). The coarse temper content (coarser than 0.2 mm) varies between (7 – 36%); (∅=21%). The fine temper content (5µ – 0.2mm) ranges from 6 – 24%; (∅=13%). All samples show probably a natural temper.

The maximum grain size found in thin sections is 7 mm. The temper particles mainly consist of mono- and polycrystalline quartz and potassium feldspars. Subordinate chert, plagioclase, sand- and siltstone, shale fragments, crystalline rock fragments, quartzite, biotite and heavy minerals can be found. Traces of volcanic rock fragments and moulds of dissolved carbonate material can be occasionally be detected.

The terrigenous sedimentary rock fragments probably originate from rocks occurring in the local flysch deposits. The crystalline rock fragments consist mainly of quartz-feldspar aggregates, likely of granitic origin. The partially sericitised feldspars represent mainly potassium feldspars, rare perthite, microcline and only subordinately plagioclase. Only very rare inclusions of muscovite or quartz-muscovite aggregates can be observed. Typical is the frequent occurrence of irregularly shaped iron oxide concretions. The potassium feldspars are frequently sericitised.

The heavy mineral composition is characterised by brookite/anatase (31%), clinopyroxene (30%) and zircon (28%). Rutile, garnet, titanite and traces of tourmaline, hornblende/amphibole and epidote/zoisite/clinozoisite rarely occur.

[4] Gassner and Sauer 2002.

Petrographic fabric type RVZ01a (pl.3 – 5)

Samples M8/8; M8/10

The fabric type RVZ01a shows an oxidised, reddish-brownish, partially optically active or partly isotropic groundmass. The groundmass is fine, micaceous and non-calcareous. The temper content ranges from 32 – 41%. The coarse temper content (>0.2 mm) varies from 20 to 22%. The fine temper content (15µ – 0.2 mm) ranges von 12 – 19%. The temper shows a very poor to slightly bimodal sorting. All samples are most likely naturally tempered.

The maximum grain size observed in thin sections is 2.5 mm. The temper particles mainly consist of mono- and polycrystalline quartz, muscovite and potassium feldspars (partially sericitised), rare chert, plagioclase, biotite, sand- and siltstone, shale fragments, crystalline rock fragments, quartzite and heavy minerals and very frequent volcanic rock fragments and sanidine, also traces of moulds of dissolved carbonates occur.

The terrigenous, sedimentary rock fragments originate most likely from reworked local Flysch rocks. The crystalline rock fragments (pl.4) mainly consist of quartz-feldspar aggregates of granitic origin. The partially sericitised feldspars (pl.4) comprise mainly potassium feldspar, rare perthite, microcline and only partially plagioclase. Very rare muscovite and quartz-muscovite aggregates can be observed. Typical and frequent are the irregularly formed iron oxide concretions.

The heavy mineral composition is characterised by the predominance of clinopyroxen (63%), subordinate zircon (17%) and brookite/anatase (9%). Rare garnet, titanite, hornblende/amphibole, rutile and traces of tourmaline and epidote/zoisite/clinozoisite occur.

The petrographical fabric type RVZ01a is differentiated from RVZ01 mainly by a slight higher mica content, the rare occurrence of carbonate concretions and heavy mineral spectra with an increased content of clinopyroxene.

Petrographic fabric type RVZ01b (pl.5 – 6)

Samples M8/17; M8/18; M8/19

The petrographic fabric type RVZ01b shows an oxidised, reddish brownish groundmass with a poor sorted to very poor sorted temper content. The groundmass is fine, micaceous and non-calcareous. The groundmass is partially optically active, partly isotropic. The temper content ranges from 31 – 38%, ∅=35%. The coarse temper content (>0.2 mm) varies from 9

to 19%. The fine temper content (15µ – 0.2 mm) ranges from 21 to 22%. All samples show most likely a natural temper.

The maximum grain size observed in thin section is 2.5 mm. The temper particles consist mainly of mono- and polycrystalline quartz and potassium feldspars (partly sericitised), subordinate muscovite and rare chert, plagioclase, sand- and siltstone grains, shale fragments, crystalline rock fragments, quartzite, heavy minerals, volcanic rock fragments and biotite occur.

The terrigenous sedimentary rock fragments originate probably from local rocks of the Flysch zone. The crystalline rock fragments mainly consist of quartz-feldspar aggregates of granitic origin. The partially sericitised feldpars consist mainly of potassium feldspar, rare perthite, microcline and only partially plagioclase. Very rare muscovite and quartz-muscovite aggregates can be observed. Typical and frequent is the occurrence of iron oxide concretions.

The heavy mineral composition (only one sample analysed) is characterised by the predominance of brookite/anatase (39%), zircon (33%) and clinopyroxene (22%). Rare rutile, garnet, hornblende/amphibole and titanite occur.

Interpretation

Based on their mineralogical and -petrographic composition, the source of the raw materials used for the fabric types RVZ01 – RVZ01b could be clearly identified. They correspond to various local (Velinian) deposits. Predominately terrace sediments and alluvial loams from the surroundings of Velia have been used.

The slight differences in their quantitative composition can be explained by inhomogeneous and variable degree of weathering and alteration of the different loam deposits. All these types could be clearly distinguished from imported bricks/tiles.[5]

Also the recent brick, sample M8/19 (RVZ01b) from the (former) brick plant of Casal Velino shows strong similarities with the antique bricks. Furthermore many of the analysed, fired loam samples from the terrace -and alluvial sediments of Velia and the near surroundings show a very similar mineralogical-petrographic composition.

[5] Gassner and Sauer 1999; Gassner and Sauer 2002.

Petrographic fabric type RVZ02 (mud bricks of Velia)

Compared to the Velinian brick and tiles, for the mud bricks different raw materials have been used. Two different local Velinian raw materials of colluvial sediments with different composition have been used for the mud bricks. Typical is the higher natural (?) temper content and the low mica content of the often very fine grained clay matrix.

(R. Sauer)

References

Gassner, V. 2003. *Materielle Kultur und kulturelle Identität in Elea in spätarchaisch-frühklassischer Zeit. Untersuchungen zur Gefäss- und Baukeramik aus der Unterstadt (Grabungen 1987-1993).* Velia Studien 2. Wien: Verl. der Österr. Akad. der Wiss.

Gassner, V., and R. Sauer. 1999. "Archäometrische Herkunftsbestimmung von Gefäßkeramik und Dachziegeln aus Velia." Forum Archaeologiae 10 /III/ 99 (http://farch.net).

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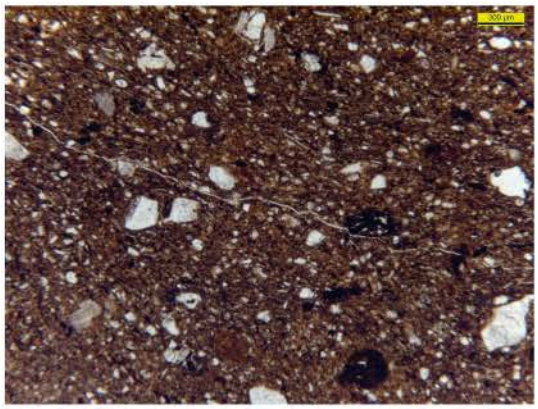
Pl. 1



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M8/5
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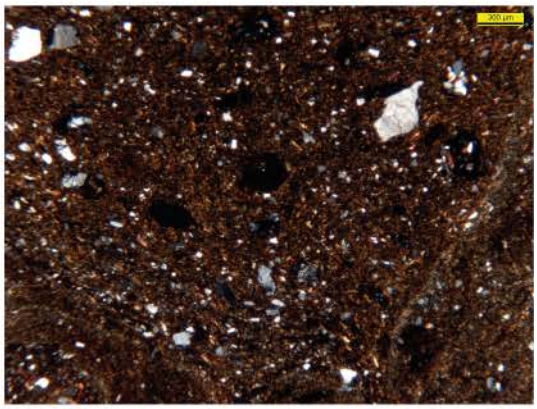

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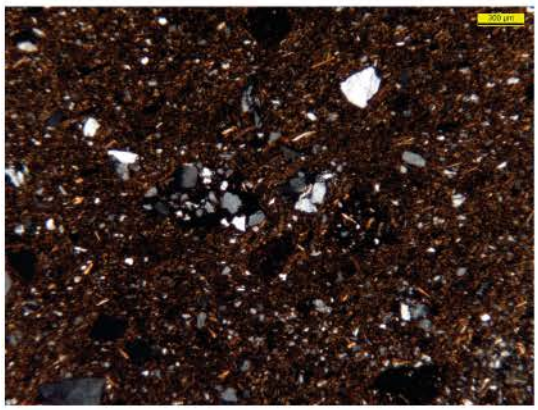

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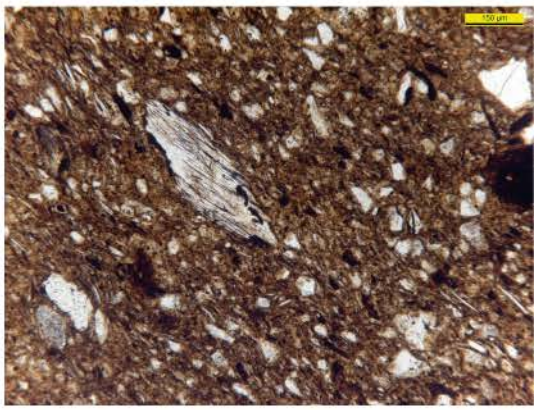

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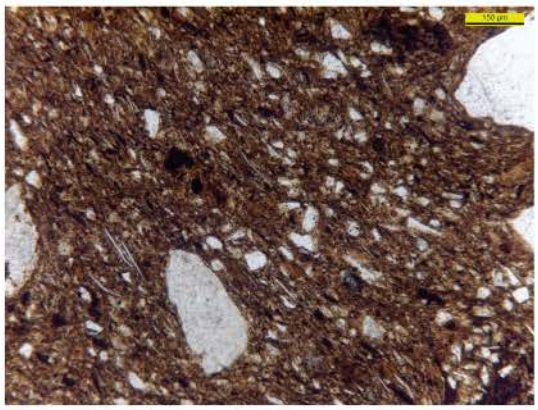

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M8/5
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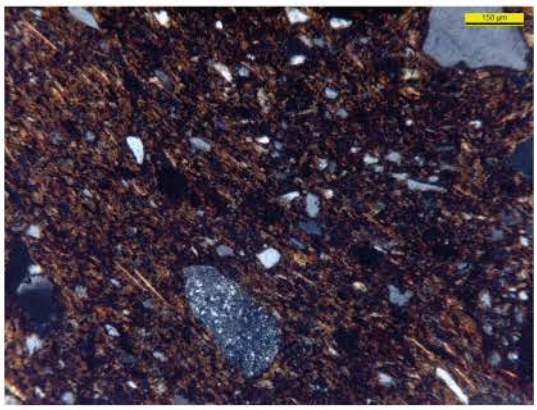

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M8/5
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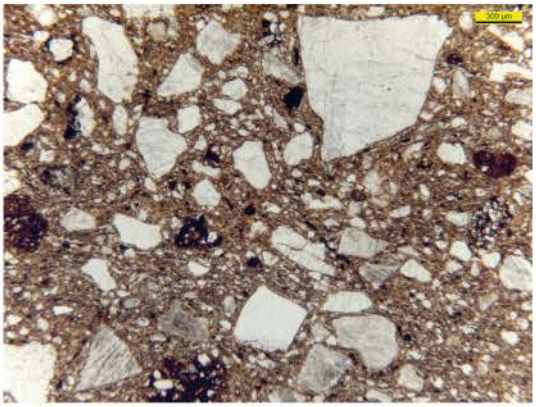
Pl. 2



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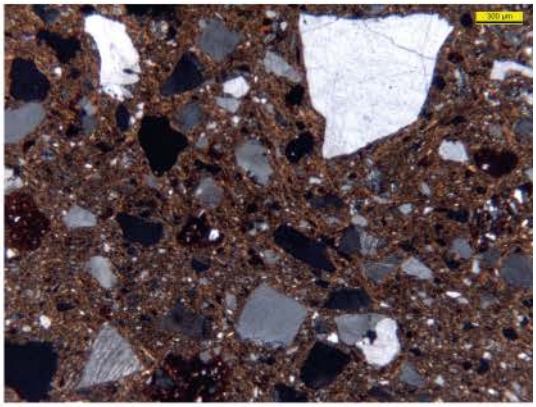

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M8/7
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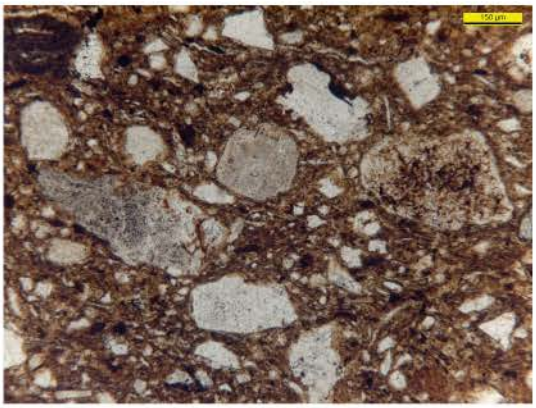

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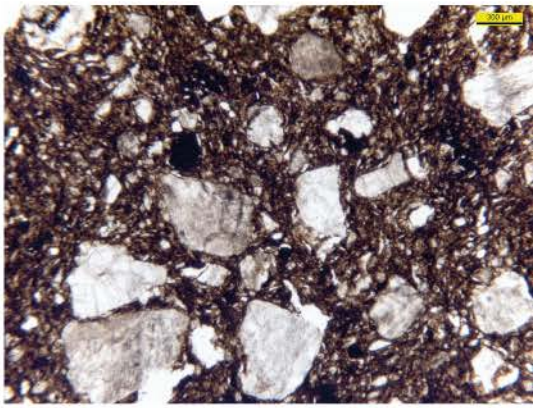

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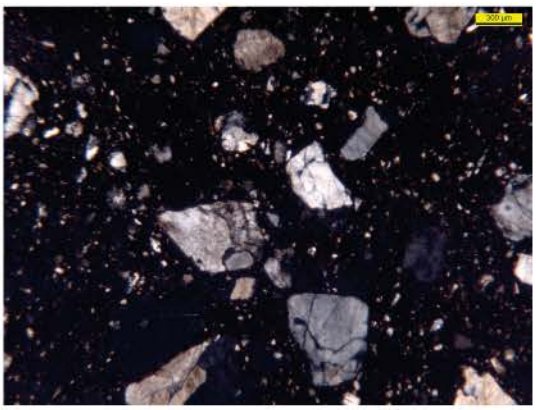

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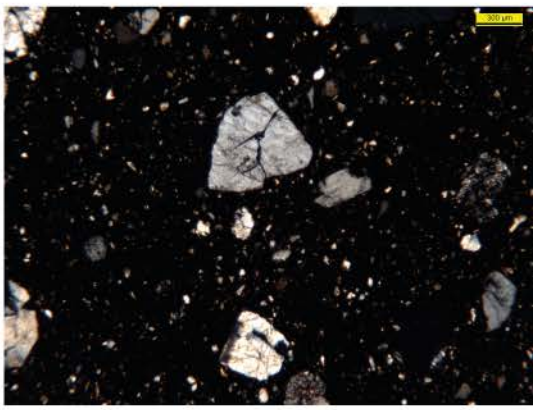

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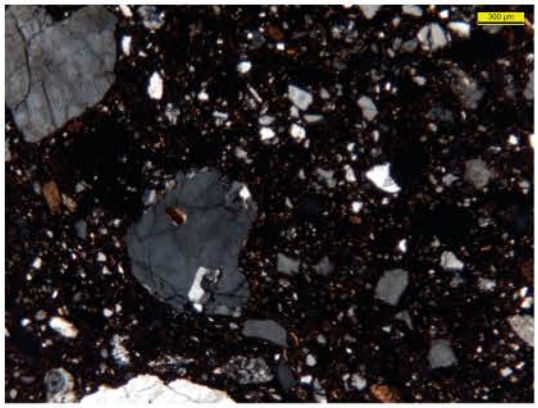

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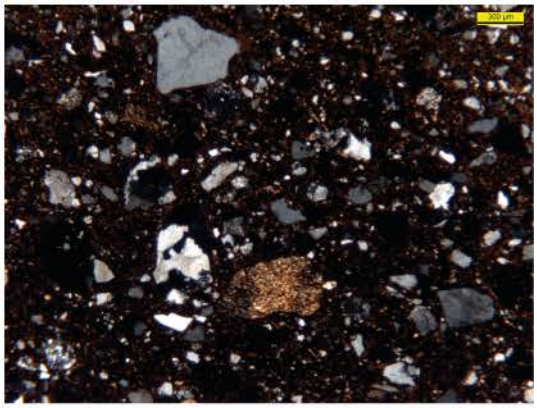

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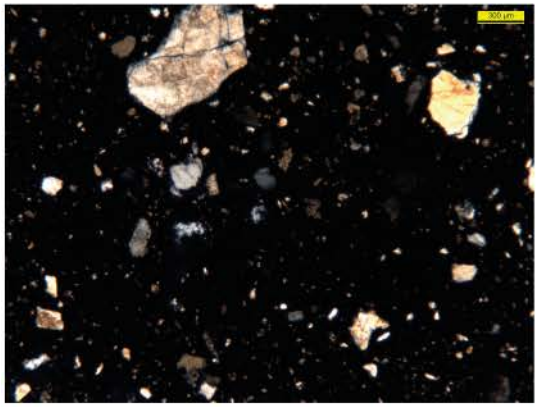

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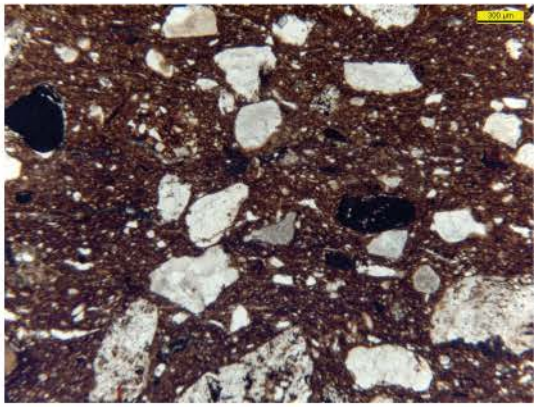

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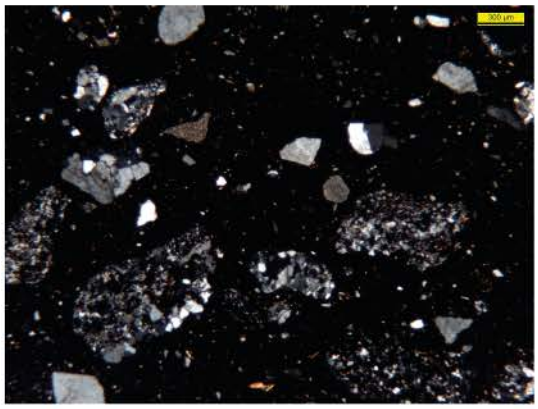

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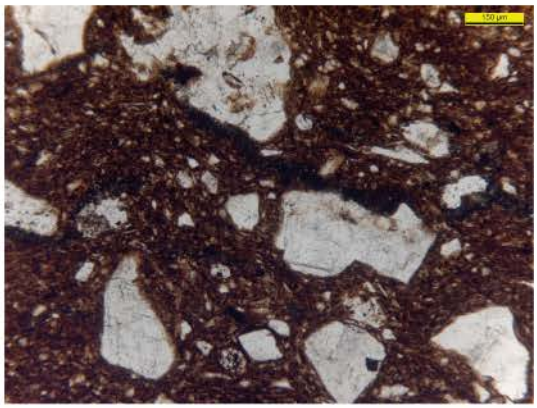

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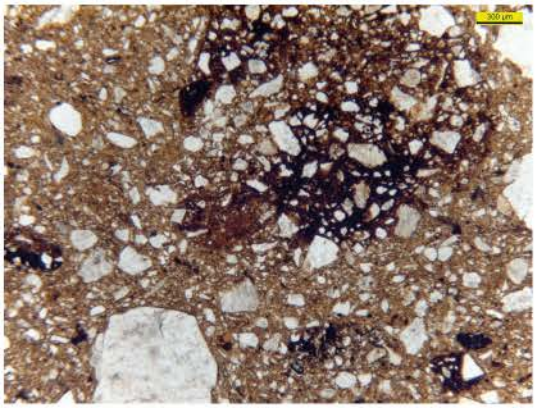

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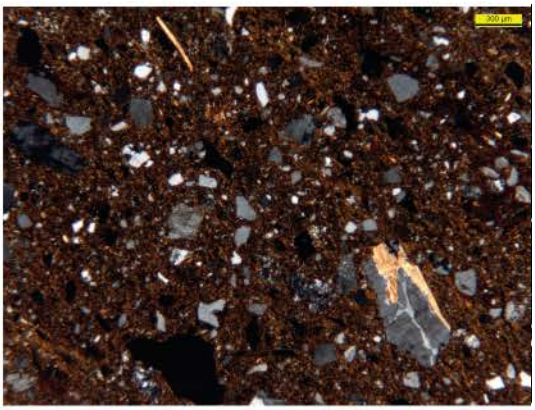

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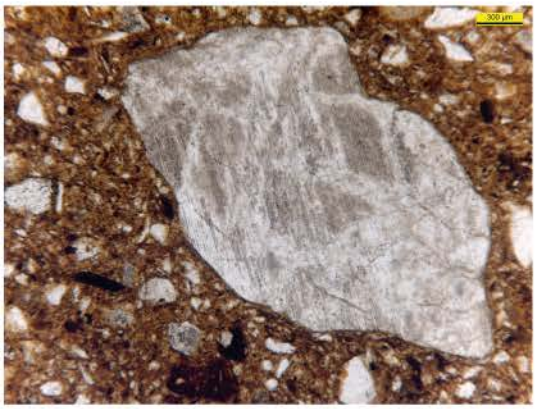

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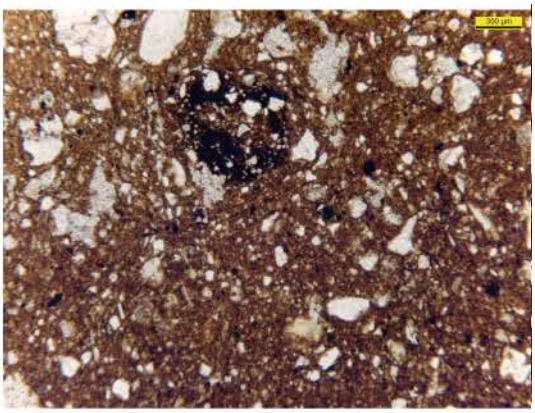

RVZ01b
recent brick
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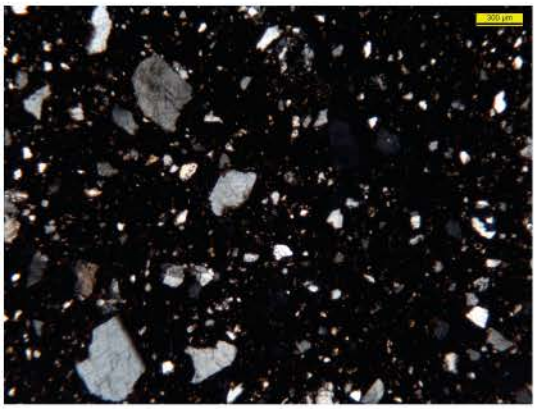

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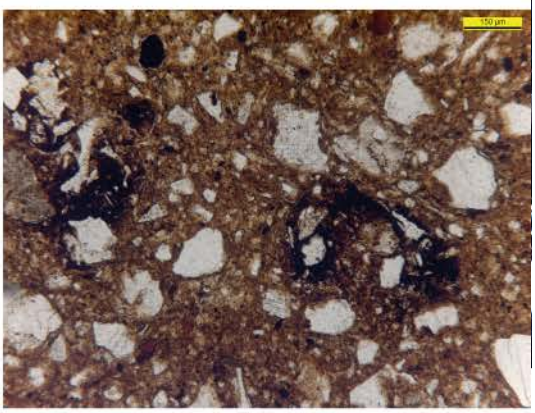

RVZ01b
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M8/19
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