

Tables from Tuuka Kaikkonen's 2015 MSc dissertation "Micromorphological investigation of soils and occupation deposits from the Trypillia culture megasite of Nebelivka, Ukraine", UCL Institute of Archaeology

Table 1. Summary of field descriptions of sampled contexts and sample numbers from the natural Chernozem profile. Contexts and samples ordered from top to bottom.

Horizon	Field description	Micromorphology samples	Figures
A	0–70 cm below surface. Dark Chernozemic clay loam with three subhorizons (A ₁ –A ₃). Subangular blocky structure and remains of rootlets.	NB13[1]/1 <ul style="list-style-type: none"> A₂ horizon, 25 cm below surface 	13, 14
		NB13[1]/2 <ul style="list-style-type: none"> Bottom of A₃ horizon, 65 cm below surface 	13, 15, 17
AB	70–110 cm below surface. Silty clay with vertical root casts.	n/a	
B	110–140 cm below surface. Lighter-coloured silty clay with rootlets, pottery fragments and a <i>krotovina</i> (burrow).	NB13[1]/3 <ul style="list-style-type: none"> Top of B horizon, 110 cm below surface; 	13, 16

Table 2. Summary of field descriptions of sampled contexts and sample numbers from the burnt house (TP 1/3). Contexts and samples ordered from top to bottom.

Layer	Field description	Micromorphology samples	Figures
A	20 cm below surface. Lower Chernozem Ap horizon: black to brown, crumbly silty clay with rootlets and occasional burnt daub inclusions. Overlies the burnt daub platform.	NB13[2]/1A <ul style="list-style-type: none"> Upper portion of layer A, 25 cm below surface 	18, 20, 24
		NB13[2]/1B <ul style="list-style-type: none"> Lower portion of layer A, exact depth unknown 	18, 21, 25, 26
B	Down to 55 cm below surface. Light brown grey, silty clay layer with burnt daub inclusions and, presumably, remains of occupation underlying the burnt daub layer.	NB13[2]/2A <ul style="list-style-type: none"> Upper portion of layer B, exact depth unknown 	19, 21, 27
		NB13[2]/2B <ul style="list-style-type: none"> Lower portion of layer B, down to 55 cm below surface 	19, 22

Table 3. Summary of field descriptions of sampled contexts and sample numbers from the unburnt house (TP 1/4). Contexts and samples ordered from top to bottom.

Layer	Field description	Micromorphology samples	Figures
A	25 cm below surface. Lower Chernozem Ap horizon: black to brown, crumbly silty clay with very occasional burnt daub inclusions. Presumably overlies the remains of a structure, now largely invisible.	NB13[3]/1A <ul style="list-style-type: none"> • Upper portion of layer A, 25 cm below surface 	28, 31
		NB13[3]/1B <ul style="list-style-type: none"> • >30 cm below surface, exact depth unknown 	28, 33–35
		NB13[3]/2A <ul style="list-style-type: none"> • >35 cm below surface, exact depth unknown 	28
		NB13[3]/2B <ul style="list-style-type: none"> • >40 cm below surface; bottom of layer A 	28, 32, 30
B	Down to 65–70 cm below surface. Light brown grey, silty clay layer with some burnt daub inclusions and, presumably, remains of occupation underlying the now invisible structure.	NB13[3]/3A <ul style="list-style-type: none"> • Upper portion of layer B, >45 cm below surface 	29
		NB13[3]/3B <ul style="list-style-type: none"> • >50 cm below surface, exact depth unknown 	29, 37
		NB13[3]/4A <ul style="list-style-type: none"> • >55 cm below surface, exact depth unknown 	29, 38
		NB13[3]/4B <ul style="list-style-type: none"> • Bottom of layer B, <65 cm below surface 	29, 36

Table 4. Summary of micromorphological observations. Only significant differences between samples are noted. Features not noted in the table but characteristic of (nearly) all samples include: porosity comprising a combination of planar voids, channels, vughs and chambers; dark brown to brown groundmass (PPL); coarse mineral fraction composed predominantly (90–99%) of silt-size quartz grains; spherical to mammillate iron nodules (vfs–ms); loose microgranular excretal infillings. The coarse mineral and organic inclusions noted in the table are very rare (<2% of groundmass) and only their size classes are noted. This is with the exception of burnt daub, for which both abundance and size classes are noted. Charcoal has been quantified and the results presented in a separate section in Chapter 4.

Sample NB13-	Microstructures		Porosity(%)	Groundmass									Pedo-features			
	(Sub)- angular blocky	Porous		c/f ratio	Micromass		Mineral			Organic				Calclitic	Infillings	
					B-fabric (XPL)		Burnt daub		Bone/ Shell	Plant tissue	Amor- phous	Charcoal				
					Un- diff.	Calc. cryst	Abundance	Size								
[1]/1	✓	-	15	2:3	✓	-	-	-	-	-	■	□■	(□)□■	-	-	
[1]/2	-	✓	25	2:3	✓	-	-	-	-	-	■	-	(□)□■	✓	✓	
[1]/3	✓	✓	10	2:3	✓	✓	-	-	-	-	-	■	-	✓	✓	
[2]/1A	✓	✓	30	1:1	✓	-	●●	■	■	■	■	■	■	(□)□■	✓	-
[2]/1B	✓	✓	40	1:1	✓	-	●●●	■	■	■	-	■	■	(□)□■	✓	-
[2]/2A	✓	✓	40	1:1	✓	✓	●●●	■	■	■	-	■	■	(□)□■	✓	-
[2]/2B	✓	✓	30	2:3	✓	✓	●	■	■	■	-	■	■	(□)□■	✓	-
[3]/1A	✓	✓	20	2:3	-	✓	●	■	■	-	-	■	■	(□)□■	✓	✓
[3]/1B	✓	✓	30	2:3	-	✓	●	■	■	■	-	-	-	(□)□■	✓	✓
[3]/2A	✓	✓	20	1:1	-	✓	●	■	■	-	-	-	-	(□)□■	✓	-
[3]/2B	✓	✓	20	1:1	-	✓	●	■	■	-	■	■	■	(□)□■	-	✓
[3]/3A	✓	✓	10	2:3	-	✓	●	■	■	■	-	-	-	(□)□■	✓	✓
[3]/3B	✓	✓	10	2:3	-	✓	●	■	■	■	-	-	-	(□)□■	✓	✓
[3]/4A	✓	✓	20	2:3	-	✓	●	■	■	■	-	-	-	(□)□■	✓	✓
[3]/4B	✓	✓	10	2:3	-	✓	(●)	■	■	■	-	-	-	(□)□■	✓	✓
[4]/1A	✓	✓	10	2:3	✓	-	●	■	■	■	■	-	■	(□)□■	✓	✓
[4]/1B	✓	✓	15	2:3	✓	-	●	■	■	■	-	-	■	(□)□■	✓	✓
[4]/2A	✓	✓	20	3:7	-	✓	(●)	■	■	■	-	-	-	(□)□■	✓	✓
[4]/2B	✓	✓	10	1:4	-	✓	-	-	-	-	-	-	-	(□)□■	✓	✓

Key

✓ = present; - = not observed

Abundance (of total groundmass): (●) very few (<2%); ● few (2–10%); ●● common (10–30%); ●●● frequent (30–50%)

Size (after Stoops, 2003): (□) clay; □ silt; ■ very fine sand; ■ fine sand; ■ medium sand; ■ coarse sand and larger

Porous = Spongy and/or granular microstructures

c/f ratio = coarse/fine fraction ratio; c/f limit = 5 μm

B-fabric: Undiff. = Undifferentiated (optically inactive); Calc. cryst. = calcitic crystallitic

Calcitic = Micritic calcite (crystals <5 μm) coatings and/or infillings

Infillings = Pores filled material that differs from the surrounding groundmass on the basis of its colour and/or composition. Usually soil transported from above, often including charcoal. Does not include ubiquitous microgranular excretal infillings.

Table 5. Macroscopic and micromorphological descriptions of the natural Chernozem profile from Nebelivka's unbuilt interior space. Soil profile described from top to bottom.

Sample	Macroscopic observations	Microstructure and porosity	Groundmass	Pedofeatures
NB13[1]1: Horizon A2, 25 cm below surface	Blocky angular structure. Interpedal planar voids, intrapedal chambers and transpedal channels. More porous structures at the bottom. 15% total porosity. Groundmass very dark greyish-brown. No appreciable inclusions.	<p>Microstructures (complex):</p> <ul style="list-style-type: none"> Subangular blocky (85% of microstructures): moderately to highly separated, randomly arranged, accommodated gravel size peds (2–6 mm); Crumb (15% of microstructures): moderately to highly separated, randomly arranged fine to coarse sand size peds (100–1000 µm); compound packing voids. <p>Total pore space 15%:</p> <ul style="list-style-type: none"> Interpedal planar voids (85% of pore space): width 50–250 µm, length <5 cm; Transpedal channels (5% of pore space): fine sand size (100–200 µm); Intrapedal chambers (10% of pore space): fine to very coarse sand size (100–2000 µm). 	<p>c/f limit: 5 µm; ratio 2:3; close to single-spaced porphyric distribution.</p> <p>Coarse minerals (>95% of coarse groundmass):</p> <ul style="list-style-type: none"> Quartz (>95% of coarse minerals): smooth, angular to subspherical; predominantly silt size (5–50 µm, >95% of quartz), very few very fine to fine sand size grains (50–200 µm, <2% of quartz) preferentially associated with chambers. Olivine (very few grains): smooth, angular to lenticular; very fine to fine sand size (50–200 µm). <p>Coarse organics (2% of coarse groundmass):</p> <ul style="list-style-type: none"> Plant stem (transverse section): dark red (PPL); coarse sand size (1 mm). Plant tissue residues (35% of coarse organics): black to dark brown (PPL), low 1st order red birefringence (XPL); elongate; coarse to very coarse sand size (0.5–2 mm); preferably within planar voids and chambers. Amorphous organic matter (35% of coarse organics): black to red (PPL); very fine to medium sand size (50–300 µm); in porous structures. Charcoal (25% of coarse organics): dull black (OIL); rectangular, with sharp boundaries; predominantly silt size (5–50 µm), very few very fine to fine sand size (50–200 µm). <p>Micromass: dark brown (PPL); undifferentiated b-fabric; black punctuations (OIL).</p>	<p>Amorphous</p> <ul style="list-style-type: none"> Fe nodules (1% of groundmass): spherical; sharp to diffuse boundaries; very fine to medium sand size (50–250 µm).
NB13[1]2: Horizon A3, 65 cm below surface	Less pedal than above. Large vertical voids (width 2–4 mm), smaller channels, chambers and vughs. 30% total porosity. Groundmass greyish-brown and largely homogeneous. A few dark brown fabrics fully or partially filling large (0.4–1 cm) chambers and channels.	<p>Microstructure:</p> <ul style="list-style-type: none"> Spongy: poorly to moderately separated. <p>Total pore space 25%:</p> <ul style="list-style-type: none"> Large vertical voids (70% of pore 	<p>c/f limit: 5 µm; ratio 2:3; close to single-spaced porphyric distribution.</p> <p>Coarse minerals (>95% of coarse groundmass):</p> <ul style="list-style-type: none"> Quartz (>95% of coarse minerals): 	<p>Crystalline</p> <ul style="list-style-type: none"> Micrite coatings (on 50% of channels and large vertical voids walls); continuous, nonlaminated, equigranular; thickness up to medium sand size <500 µm);

Sample	Macroscopic observations	Microstructure and porosity	Groundmass	Pedofeatures
		<p>space): width 2–4 mm, length >5 cm;</p> <ul style="list-style-type: none"> • Channels (20% of pore space): very fine sand size (50–100 µm); • Vughs (10% of pore space): fine sand size (100–200 µm). 	<p>smooth, angular to subspherical; predominantly silt size (5–50 µm, >95% of quartz), very few very fine to fine sand size grains (50–200 µm, <2% of quartz) preferentially associated with chambers.</p> <p>Coarse organics (1% of coarse groundmass):</p> <ul style="list-style-type: none"> • Plant tissue residues (20% of coarse organics): elongated, black to dark brown (PPL), 1st order birefringence (XPL), coarse to very coarse sand size (1–2 mm); with large vertical voids. • Charcoal (80% of coarse organics): dull black (OIL); rectangular with sharp boundaries; silt to very fine sand size (5–100 µm); associated with melanised fabric. <p>Micromass: brown (PPL); undifferentiated b-fabric; black punctuations particularly in melanised fabric (OIL).</p>	<p>occasional crystal needling.</p> <p>Amorphous</p> <ul style="list-style-type: none"> • Fe nodules (2% of groundmass): spherical, with sharp to diffuse boundaries; very fine to medium sand size (50–250 µm). <p>Fabric</p> <ul style="list-style-type: none"> • Infillings (5% of groundmass): dark brown (PPL); dense continuous infillings of channels and chambers; coarse sand size (400–1000 µm). <p>Excrement</p> <ul style="list-style-type: none"> • Microgranular infillings: loose continuous; spherical; dense microaggregates; colour and composition c.f. soil matrix; within channels.

Sample	Macroscopic observations	Microstructure and porosity	Groundmass	Pedofeatures
NB13[1]/3: Horizon B, 110 cm below surface	<p>Vughy structure. 15% overall porosity. Groundmass yellowish-brown and largely homogenous. Small dark brown fabrics. A large vertical channel (2.2 x 0.7 cm) loosely infilled with light yellowish-brown and dark brown fabric.</p>	<p>Microstructures (complex):</p> <ul style="list-style-type: none"> • Massive (20% of microstructures). • Spongy (50% of microstructures); • Granular (30% of microstructures): compound packing voids; <p>Total pore space 10%:</p> <ul style="list-style-type: none"> • Planar voids (5% of pore space): medium sand size (200–500 µm); • Channels (30% of pore space): medium sand size (200–500 µm); • Chambers (10% of pore space): medium sand size (200–500 µm); • Vughs (10–250 µm, 50% of pore space). 	<p>c/f limit: 5 µm; ratio 2:3; single to double-spaced porphyric distribution.</p> <p>Coarse minerals (99% of coarse groundmass):</p> <ul style="list-style-type: none"> • Quartz: smooth, angular to subspherical; predominantly silt size (5–50 µm, >95% of quartz), very few very fine to fine sand size grains (50–200 µm, <2% of quartz). <p>Coarse organics (1% of coarse groundmass):</p> <ul style="list-style-type: none"> • Amorphous organic matter: black (PPL); fine sand size (250 µm). <p>Micromass: brown (PPL); calcitic crystallitic b-fabric incompletely obscured by undifferentiated b-fabric.</p>	<p>Crystalline</p> <ul style="list-style-type: none"> • Micrite coatings (on 80% of pore walls): continuous, nonlaminated, equigranular, thickness up to medium sand size (<500 µm); frequent crystal needling. • Calcite impregnation (one occurrence): weakly impregnative, with sharp boundaries; medium sand size (500µm). <p>Amorphous</p> <ul style="list-style-type: none"> • Fe nodules (<2% of groundmass): spherical to mammilate; fine to medium sand size (100–500 µm). <p>Fabric</p> <ul style="list-style-type: none"> • Infillings (<10% of groundmass): dark brown (PPL); dense continuous; coarse sand to gravel size (1–4 mm); one loose continuous infilling of a large channel (>2.2 x 0.7 cm); in channels and chambers, surrounding matrix compacted into massive microstructure. <p>Excrement</p> <ul style="list-style-type: none"> • Microgranular infillings: loose continuous; spherical; dense microaggregates; colour and composition c.f. soil matrix; within channels.

Table 6. Macroscopic and micromorphological descriptions of the burnt house (TP 1/3). Sedimentary sequence described from top to bottom.

Sample	Macroscopic observations	Microstructure and porosity	Groundmass	Pedofeatures
NB13[2]/1A: Layer A, >25 cm below surface	<p>Heterogeneous mix of Chernozem soil (90%) and burnt daub (10%).</p> <p>Well separated, nonaccommodated subangular blocky peds (3–5 mm) grading porous structures. Interpedal vertical planar voids and compound packing voids running the length of the slide; intrapedal chambers and vughs. Total porosity 30%. Groundmass dark brown to greyish-brown. Pink, orange and yellow subangular burnt daub fragments (1–10 mm).</p>	<p>Microstructures (complex):</p> <ul style="list-style-type: none"> Subangular blocky (30% of microstructures): highly separated, randomly arranged, nonaccommodated fine sand to gravel size peds (125 μm – 3 mm); Spongy to granular (70% of microstructures): moderately to highly separated; compound packing voids. <p>Total pore space 30%:</p> <ul style="list-style-type: none"> Interpedal planar voids (5% of pore space): width very fine to medium sand size (50–250 μm); Channels (10% of pore space): medium sand size (250 μm); Chambers (40% of pore space): fine to gravel size (<3 mm); Vughs (35% of pore space): often interconnected; fine sand size (100–200 μm). 	<p>c/f limit: 5 μm; ratio 1:1; close to single-spaced porphyric distribution.</p> <p>Coarse minerals (>95% of coarse groundmass):</p> <ul style="list-style-type: none"> Quartz (>80% of coarse minerals): smooth, angular to subspherical; predominantly silt size (5–50 μm, >95% of quartz), very few very fine to fine sand size grains (50–200 μm, <2% of quartz). Shell fragment (two specimens): bleached (calcite replaced?), medium sand size (250 and 400 μm); probably a land snail. Burnt daub (<20% of coarse minerals): pink, orange and yellow (OIL); smooth, subangular to platy; fine sand to gravel size (125 μm – 1 cm); planar voids, vughs; composed of silt size quartz (5–50 μm); undifferentiated to calcitic crystallitic b-fabrics. <p>Coarse organics (3% of coarse groundmass):</p> <ul style="list-style-type: none"> Plant tissue residues (60% of coarse organics): yellow to dark brown (PPL), low 1st order birefringence (XPL); elongated; coarse to very coarse sand size (0.5–2 mm); preferably within planar voids and chambers. Amorphous organic matter (20% of coarse organics): black to red (PPL); very fine to medium sand size (50–300 μm); within compound packing voids. Charcoal (20% of coarse organics): dull black (OIL); rectangular, with sharp boundaries; silt size (5–50 μm); embedded in melanised soil. <p>Micromass: dark brown (PPL); undifferentiated b-fabric; black punctuations (OIL).</p>	<p>Crystalline</p> <ul style="list-style-type: none"> Micrite infillings and pendent (on daub): continuous, nonlaminated, equigranular; thickness silt to medium sand size (10–500 μm); frequent crystal needling. Calcite impregnations (1% of groundmass): strongly impregnative, with sharp boundaries; coarse sand size (500–1000μm). <p>Amorphous</p> <ul style="list-style-type: none"> Fe nodules (<1% of groundmass): spherical, very fine to medium sand size (50–500 μm). <p>Excrement</p> <ul style="list-style-type: none"> Microgranular infillings: loose continuous; spherical to mammillate; dense microaggregates; colour and composition c.f. soil matrix; within channels and chambers.
NB13[2]/1B: Layer A, >30 cm below	<p>Heterogeneous mix of Chernozem soil (66%) and burnt daub (33%).</p>	<p>Microstructures (complex):</p> <ul style="list-style-type: none"> Subangular blocky (30% of microstructures): moderately to 	<p>c/f limit: 5 μm; ratio 1:1; close to single-spaced porphyric distribution.</p>	<p>Crystalline</p> <ul style="list-style-type: none"> Micrite coatings (in daub pores): continuous, nonlaminated,

Sample	Macroscopic observations	Microstructure and porosity	Groundmass	Pedofeatures
surface	Vertically banded, well separated angular blocky peds (2–5 mm) paralleling a large daub fragment and grading downwards into porous structures. Interpedal planar voids and chambers (1–7 mm). Total porosity 40%. Groundmass dark to greyish brown. C. 10 subangular to lenticular, orange to pale yellow burnt daub fragments (1 mm – 2.5 cm); an orange fragment degrades downwards into a grey diffuse (molten?) structure with a calcite pendent.	highly separated, banded, partially accommodated peds (1–3 mm); grades into: <ul style="list-style-type: none"> • Spongy (50% of microstructures), and • Granular (20% of microstructures): moderately to well-separated (aggregates 50–200 µm); compound packing voids. Total pore space 40%: <ul style="list-style-type: none"> • Interpedal planar voids (10% of pore space): width very fine to medium sand size (50–250 µm). • Vughs (90% of pore space): often interconnected; fine sand size (100–200 µm). 	Coarse minerals (>95% of coarse groundmass): <ul style="list-style-type: none"> • Quartz (50% of coarse minerals): smooth, angular to subspherical; predominantly silt size (5–50 µm, >95% of quartz), very few very fine to fine sand size grains (50–200 µm, <2% of quartz). • Burnt daub (50% of coarse minerals): orange to yellow (OIL); smooth, subangular to platy; fine sand to gravel size (125 µm – 2.5 cm); planar voids, vughs; composed of silt size quartz (5–50 µm); undifferentiated to crystallitic b-fabrics. Coarse organics (3% of coarse groundmass): <ul style="list-style-type: none"> • Seed or stem section (one specimen): gravel size (1.5 mm). • Plant tissue residues (80% of coarse organics): black to dark brown (PPL), 1st order birefringence (XPL); elongated; coarse to very coarse sand size (0.5–2 mm); preferably within planar voids and chambers. • Amorphous organic matter (10% of coarse organics): black to red (PPL); very fine to medium sand size (50–300 µm); within compound packing voids. • Charcoal (10% of coarse organics): dull black (OIL); rectangular, with sharp boundaries; silt to fine sand size size (5–125 µm); preferentially associated with burnt daub and melanised soil. Micromass: dark brown (PPL); undifferentiated b-fabric; black punctuations (OIL).	equigranular; thickness silt to medium sand size (<10–500 µm); frequent crystal needling. <ul style="list-style-type: none"> • Micrite pendent (bottom of orange daub); laminated; continuous, equigranular; thickness up to medium sand (<500 µm); encases a vughy microstructure with dark brown groundmass (OIL). • Calcite impregnations (<2% of groundmass): strongly impregnative, with sharp boundaries; coarse sand size (500–1000µm). Amorphous <ul style="list-style-type: none"> • Fe nodules (<1% of groundmass): spherical; medium sand size (50–500 µm). Excrement <ul style="list-style-type: none"> • Microgranular infillings: loose continuous; spherical to mammilate; dense microaggregates; colour and composition c.f. soil matrix; within channels and chambers.
NB13[2]/2A: Layer B, >35 cm below surface	Heterogeneous mix of Chernozem soil (66%) and burnt daub (33%). Angular blocky peds (2–5 mm) grading downwards into a porous structure. Interpedal	Microstructures (complex): <ul style="list-style-type: none"> • Subangular blocky (50% of microstructures): moderately to highly separated, with accommodated peds (1–5 mm); 	c/f limit: 5 µm; ratio 1:1; close to single-spaced porphyric distribution. Coarse minerals (>95% of coarse groundmass):	Crystalline <ul style="list-style-type: none"> • Micrite coatings (in daub pores): continuous, nonlaminated, equigranular; thickness silt to medium sand size (<10–500 µm);

Sample	Macroscopic observations	Microstructure and porosity	Groundmass	Pedofeatures
	<p>planar voids and compound packing voids (0.8→1.5 cm). Total porosity 40%. Groundmass dark to greyish brown. Orange to pale yellow burnt daub fragments (1 mm – 2 cm).</p>	<p>grades into:</p> <ul style="list-style-type: none"> Spongy (30% of microstructures), and Granular (20% of microstructures): moderately to well-separated (aggregates 50–200 µm); compound packing voids. <p>Total pore space 40%:</p> <ul style="list-style-type: none"> Interpedal planar voids (20% of pore space): width very fine to fine sand size (50–200 µm); Vughs (80% of pore space): often interconnected; fine to coarse sand size (125–1000 µm). 	<ul style="list-style-type: none"> Quartz (66% of coarse minerals): smooth, angular to subspherical; predominantly silt size (5–50 µm, >95% of quartz), very few very fine to fine sand size grains (50–200 µm, <2% of quartz). Olivine (one grain): smooth, angular; silt size (50 µm). Shell (one fragment): grey (PPL), no birefringence (XPL); curved, 1.5 mm; probably a land snail. Burnt daub (30% of coarse minerals): orange to yellow (OIL); smooth, subangular to platy; fine sand to gravel size (125 µm – 2.5 cm); planar voids, vughs; composed of silt size quartz (5–50 µm); undifferentiated to crystallitic b-fabrics; possible amorphous organic matter infilling planar voids. <p>Coarse organics (2% of coarse groundmass):</p> <ul style="list-style-type: none"> Seed or stem section (one specimen): gravel size (1.5 mm). Amorphous organic matter (50% of coarse organics): black (PPL); very fine to fine sand size (50–200 µm); within voids. Charcoal (50% of coarse organics): dull black (OIL); rectangular, with sharp boundaries; silt to fine sand size size (5–200 µm); larger particles show comminution; preferentially associated with burnt daub and melanised soil. <p>Micromass: dark brown to yellow (PPL); calcitic crystallitic b-fabric partly obscured by undifferentiated b-fabric; black punctuations (OIL).</p>	<ul style="list-style-type: none"> frequent crystal needling. Micrite cappings and pendants (on 95% of pores on large orange daub fragment): nonlaminated; continuous, equigranular; thickness silt to fine sand size (<10–200 µm). Calcite impregnations (<2% of groundmass): moderately impregnative, with sharp boundaries; coarse sand size (500–1000µm). <p>Amorphous</p> <ul style="list-style-type: none"> Fe nodules (<1% of groundmass): spherical; fine sand size (100–200 µm). <p>Excrement</p> <ul style="list-style-type: none"> Microgranular infillings: loose continuous; spherical to mammillate; dense microaggregates; colour and composition c.f. soil matrix; within channels and chambers.
<p>NB13[2]/2B: Layer B, <55 cm below surface</p>	<p>Chernozem soil fragmented into angular units (1–2.5 cm wide) with internal blocky angular peds (3–5 mm wide). Interpedal planar voids, intrapedal vughs, chambers and channels. Total porosity 15% porosity within the angular units. Groundmass a mosaic of dark greyish-brown to yellowish brown infillings. Orange</p>	<p>Microstructures (complex):</p> <ul style="list-style-type: none"> Massive (10% of microstructures); Spongy (80% of microstructures); Vughy (10% of microstructures). <p>Total pore space 30%:</p> <ul style="list-style-type: none"> Planar voids (10% of pore space): 	<p>c/f limit: 5 µm; ratio 2:3; close to open porphyric distribution.</p> <p>Coarse minerals (>95% of coarse groundmass):</p> <ul style="list-style-type: none"> Quartz (90% of coarse minerals): smooth, angular to subspherical; 	<p>Crystalline</p> <ul style="list-style-type: none"> Micrite coatings (in <5% of voids): continuous, nonlaminated, equigranular; thickness silt to medium sand size (<10–500 µm); frequent crystal needling.

Sample	Macroscopic observations	Microstructure and porosity	Groundmass	Pedofeatures
	burnt daub fragments (<2 mm).	<p>width very fine to medium sand size (50–250 µm);</p> <ul style="list-style-type: none"> • Channels (30% of pore space): medium sand size (250 µm); • Chambers (10% of pore space): gravel size (2–5 mm); • Vughs (50% of pore space): often interconnected; medium to coarse sand size (250–1000 µm). 	<p>predominantly silt size (5–50 µm, >95% of quartz), very few very fine to fine sand size grains (50–200 µm, <2% of quartz).</p> <ul style="list-style-type: none"> • Olivine (one grain): smooth, angular; silt size (50 µm). • Feldspar (one grain): smooth, angular; medium sand size (250 µm). • Burnt daub (10% of coarse minerals): orange to yellow (OIL); smooth, subangular to platy; silt to gravel size (<50 µm – 2.5 cm); planar voids, vughs; composed of silt size quartz (5–50 µm); undifferentiated to crystallitic b-fabrics. <p>Coarse organics (1% of coarse groundmass):</p> <ul style="list-style-type: none"> • Charcoal : dull black (OIL); rectangular, with sharp boundaries; silt to very fine sand size (5–100 µm). <p>Micromass: dark brown to yellowish brown (PPL); calcitic crystallitic b-fabric; black punctuations.</p>	<p>Amorphous</p> <ul style="list-style-type: none"> • Fe nodules (<1% of groundmass): spherical; medium sand size (300–400 µm). <p>Excrement</p> <ul style="list-style-type: none"> • Microgranular infillings: loose continuous; spherical to mammillate; dense microaggregates; colour and composition c.f. soil matrix; within channels and chambers.

Table 7. Macroscopic and micromorphological descriptions of the unburnt house (TP 1/4). Sedimentary sequence described from top to bottom.

Sample	Macroscopic observations	Microstructure and porosity	Groundmass	Pedofeatures
NB13[3]/1A: Layer A, >25 cm below surface	Moderately separated, angular blocky structure (peds 2–5 mm) with interpedal planar voids and chambers and intrapedal vughs. 10% total porosity. Groundmass dark greyish-brown. Circa 5 burnt daub fragments (<3 mm). Some loose soil infillings and melanised infillings .	<p>Microstructures (complex):</p> <ul style="list-style-type: none"> Angular to subangular blocky (80% of microstructures): moderately to highly separated, randomly arranged, accommodated coarse sand to gravel size peds (1–5 mm); fraying into: Spongy (20% of microstructures). <p>Total pore space 20%:</p> <ul style="list-style-type: none"> Interpedal planar voids (50% of pore space): width 50–1000 µm, length <2 cm); Intrapedal channels (15% of pore space): fine to medium sand size (125–250 µm); Interpedal chambers (30% of pore space): gravel size (2–5 mm); Intrapedal vughs (15% of pore space): very fine to medium sand size (50–500 µm). 	<p>c/f limit: 5 µm; ratio 2:3; close to single-spaced porphyric distribution.</p> <p>Coarse minerals (>95% of coarse groundmass):</p> <ul style="list-style-type: none"> Quartz (90% of coarse minerals): smooth, angular to subspherical; predominantly silt size (5–50 µm, 90% of quartz), very few very fine to fine sand size grains (50–200 µm, <2% of quartz). Shell fragments (two specimens): dull grey (PPL), 1st order birefringence; medium and very coarse sand size (250 µm and 1.5 mm); probably land snails. Burnt daub (<10% of coarse minerals): orange and yellow (OIL); smooth, subangular to platy; medium sand to gravel size (250 µm – 3 mm); composed of silt size quartz (5–50 µm); undifferentiated to calcitic crystallitic b-fabrics. <p>Coarse organics (1% of coarse groundmass):</p> <ul style="list-style-type: none"> Amorphous organic matter (10% of coarse organics): black to red (PPL); very fine to medium sand size (50–250 µm); within planar voids and chambers. Charcoal (90% of coarse organics): dull black (OIL); rectangular, with sharp boundaries; predominantly silt to very fine sand size (5–100 µm), one medium sand size fragment with cell structure (400 µm); embedded in melanised soil. <p>Micromass: dark brown (PPL); weakly expressed calcitic crystallitic b-fabric; black punctuations.</p>	<p>Crystalline</p> <ul style="list-style-type: none"> Micrite coatings (on 30% of planar void walls): continuous, nonlaminated, equigranular; thickness silt to medium sand size (10–250 µm); occasional crystal needling. Micrite infillings: dense incomplete; within chambers (500 µm – 2.5 mm) <p>Amorphous</p> <ul style="list-style-type: none"> Fe nodules (<1% of groundmass): spherical to mammilate; very fine to medium sand size (50–250 µm). <p>Fabric</p> <ul style="list-style-type: none"> Infillings (<5% groundmass): dark brown (PPL); dense continuous; in chambers (2–5 mm); higher densities of charcoal than in the dominant groundmass. <p>Excrement</p> <ul style="list-style-type: none"> Microgranular infillings: loose continuous; spherical to mammilate; dense microaggregates; colour and composition c.f. soil matrix; within channels and chambers.
NB13[3]/1B: Layer A, >30 cm below surface	Moderately separated, subangular blocky structure (peds 1–5 mm) with interpedal planar voids and chambers and intrapedal vughs. One large channel (0.2 x 1.8 cm). 20% total porosity. Groundmass dark greyish-brown. One large (3 x 5 mm),	<p>Microstructures (complex):</p> <ul style="list-style-type: none"> Subangular blocky (60% of microstructures): moderately to highly separated, randomly arranged, accommodated coarse 	<p>c/f limit: 5 µm; ratio 2:3; close to single-spaced porphyric distribution.</p> <p>Coarse minerals (>95% of coarse groundmass):</p> <ul style="list-style-type: none"> Quartz (95% of coarse minerals): 	<p>Crystalline</p> <ul style="list-style-type: none"> Micrite coatings (on 20% of planar and packing void walls): continuous, nonlaminated, equigranular; thickness silt to medium sand size

Sample	Macroscopic observations	Microstructure and porosity	Groundmass	Pedofeatures
	<p>subspherical, brown nodule, possibly unburnt daub. Some loose soil infillings.</p>	<p>sand to gravel size peds (1–5 mm);</p> <ul style="list-style-type: none"> • Spongy (20% of microstructures): poorly separated, grading into: • Granular (20% of microstructures): compound packing voids. <p>Total pore space 30%:</p> <ul style="list-style-type: none"> • Interpedal planar voids (50% of pore space): width 50–1000 µm, length <1.5 cm); • Intrapedal channels (10% of pore space): fine to medium sand size (125–250 µm); • Interpedal chambers (30% of pore space): gravel size (2–5 mm); • Intrapedal vughs (20% of pore space): very fine to medium sand size (50–500 µm). 	<p>smooth, angular to subspherical; predominantly silt size (5–50 µm, 90% of quartz), very few very fine to fine sand size grains (50–200 µm, <2% of quartz).</p> <ul style="list-style-type: none"> • Shell fragments (one specimen): dull grey (PPL), 1st order birefringence; medium and very coarse sand size (250 µm and 1.5 mm). • Daub (5% of coarse minerals): yellow (OIL); smooth, subangular to platy; medium sand to gravel size (3–5 mm); composed of silt to medium sand size quartz (5–250 µm); undifferentiated b-fabric; either burnt and weathered or less intensively burnt. <p>Coarse organics (1% of coarse groundmass):</p> <ul style="list-style-type: none"> • Charcoal: dull black (OIL); rectangular, with sharp boundaries; predominantly silt to fine sand size (5–200 µm), one medium sand size fragment (250 µm); embedded in melanised soil, in very loose clusters. <p>Micromass: dark brown (PPL); weakly expressed calcitic crystallitic b-fabric; black punctuations.</p>	<p>(10–250 µm); occasional crystal needling.</p> <ul style="list-style-type: none"> • Micrite infilling: dense incomplete; within chamber (250 x 1000 µm) • Calcite impregnations (<2% of groundmass): weakly to moderately impregnative; medium to coarse sand size (500–1000µm). <p>Amorphous</p> <ul style="list-style-type: none"> • Fe nodules (<1% of groundmass): spherical to mammillate; very fine to medium sand size (50–250 µm). <p>Fabric</p> <ul style="list-style-type: none"> • Infillings (<5% groundmass): dark brown (PPL); loose discontinuous; in chambers (2–5 mm). <p>Excrement</p> <ul style="list-style-type: none"> • Microgranular infillings: loose continuous; spherical to mammillate; dense microaggregates; colour and composition c.f. soil matrix; within channels and chambers.
<p>NB13[3]/2A: Layer A, >35 cm below surface</p>	<p>Moderately separated, angular blocky structure (peds 1–5 mm) with interpedal planar voids and chambers and intrapedal vughs. 15% total porosity. Groundmass dark greyish-brown. Three burnt daub fragments (1–2 mm). Some loose soil infillings and melanised infillings.</p>	<p>Microstructures (complex):</p> <ul style="list-style-type: none"> • Subangular blocky (40% of microstructures): moderately to highly separated, randomly arranged, accommodated coarse sand to gravel size peds (1–5 mm); • Spongy (40% of microstructures): 	<p>c/f limit: 5 µm; ratio 1:1; close to single-spaced porphyric distribution.</p> <p>Coarse minerals (>95% of coarse groundmass):</p> <ul style="list-style-type: none"> • Quartz (95% of coarse minerals): smooth, angular to subspherical; predominantly silt size (5–50 µm, 90% of quartz), very few very fine to fine 	<p>Crystalline</p> <ul style="list-style-type: none"> • Micrite coatings (on 10% of vugh and chamber walls): continuous, nonlaminated, equigranular; thickness silt to medium sand size (10–250 µm); occasional crystal needling. • Sparite impregnation: moderately

Sample	Macroscopic observations	Microstructure and porosity	Groundmass	Pedofeatures
		<ul style="list-style-type: none"> • poorly separated, grading into: Granular (20% of microstructures): compound packing voids. <p>Total pore space 20%:</p> <ul style="list-style-type: none"> • Interpedal planar voids (40% of pore space): width 50–1000 µm, length <2 cm); • Intrapedal channels (20% of pore space): fine to medium sand size (125–250 µm); • Interpedal chambers (20% of pore space): gravel size (2–4 mm); • Intrapedal vughs (20% of pore space): very fine to medium sand size (125–250 µm). 	<p>sand size grains (50–200 µm, <2% of quartz).</p> <ul style="list-style-type: none"> • Burnt daub (5% of coarse minerals): orange to yellow (OIL); smooth, subangular to platy; medium sand to gravel size (1–2 mm); composed of silt size quartz (5–50 µm); undifferentiated to calcitic crystallitic b-fabrics. <p>Coarse organics (1% of coarse groundmass):</p> <ul style="list-style-type: none"> • Charcoal: dull black (OIL); rectangular, with sharp boundaries; silt to fine sand size (5–150 µm); embedded in melanised soil. <p>Micromass: dark brown (PPL); weakly expressed calcitic crystallitic b-fabric; black punctuations.</p>	<p>impregnative; medium sand size (500 µm).</p> <p>Amorphous</p> <ul style="list-style-type: none"> • Fe nodules (<1% of groundmass): spherical to mammilate; very fine to medium sand size (50–250 µm). <p>Excrement</p> <ul style="list-style-type: none"> • Microgranular infillings: loose continuous; spherical to mammilate; dense microaggregates; colour and composition c.f. soil matrix; within channels and chambers.
NB13[3]/2B: Layer A, >40 cm below surface	<p>Moderately separated, angular blocky structure (peds 2–3 mm) with internal, poorly to moderately separated angular blocky peds (<5 mm). Interpedal planar voids and chambers and intrapedal channels. Large zigzagging planar void >6 cm long, up to 2 mm wide. 20% total porosity. Groundmass dark greyish-brown. Burnt daub fragments (1–3 mm). Loosely infilled chamber (>1 cm) and melanised infillings.</p>	<p>Microstructures (complex):</p> <ul style="list-style-type: none"> • Subangular blocky (40% of microstructures): poorly to moderately separated, randomly arranged, accommodated coarse sand to gravel size peds (1–5 mm); • Spongy (30% of microstructures): poorly separated, grading into: • Granular (30% of microstructures): compound 	<p>c/f limit: 5 µm; ratio 1:1; close to single-spaced porphyric distribution.</p> <p>Coarse minerals (90% of coarse groundmass):</p> <ul style="list-style-type: none"> • Quartz (90% of coarse minerals): smooth, angular to subspherical; predominantly silt size (5–50 µm, 90% of quartz), very few very fine to fine sand size grains (50–200 µm, <2% of quartz). • Burnt daub (10% of coarse minerals): 	<p>Amorphous</p> <ul style="list-style-type: none"> • Fe nodules (<1% of groundmass): spherical to mammilate; very fine to medium sand size (50–250 µm). <p>Fabric</p> <ul style="list-style-type: none"> • Loosely infilled chamber (0.5 x 2 cm): complex packing voids; amorphous organic matter, plant tissue residues, and angular melanised soils aggregates units

Sample	Macroscopic observations	Microstructure and porosity	Groundmass	Pedofeatures
		<p>packing voids.</p> <p>Total pore space 20%:</p> <ul style="list-style-type: none"> • Interpedal planar voids (60% of pore space): width 50–500 µm, length <2 cm); • Intrapedal channels (30% of pore space): fine to medium sand size (125–250 µm); • Interpedal chambers (10% of pore space): gravel size (2–4 mm). 	<p>orange to yellow (OIL); smooth, subangular to platy; medium sand to gravel size (1–3 mm); composed of silt size quartz (5–50 µm); undifferentiated to calcitic crystallitic b-fabrics.</p> <p>Coarse organics (2% of coarse groundmass):</p> <ul style="list-style-type: none"> • Plant tissue residues (45% of coarse organics): black to dark brown (PPL), 1st order birefringence (XPL); elongated; medium sand size (250 µm); preferably within planar voids and chambers. • Amorphous organic matter (45% of coarse organics): black to red (PPL); very fine to medium sand size (50–250 µm). • Charcoal (10% of coarse organics): dull black (OIL); rectangular, with sharp boundaries; predominantly silt to fine sand size (5–200 µm); particularly concentrated around the loosely infilled chamber. <p>Micromass: dark brown (PPL); weakly expressed calcitic crystallitic b-fabric; black punctuations.</p>	<p>(<1 mm).</p> <p>Excrement</p> <ul style="list-style-type: none"> • Microgranular infillings: loose continuous; spherical to mammilate; dense microaggregates; colour and composition c.f. soil matrix; within channels and chambers.
<p>NB13[3]/3A: Layer B, >45 cm below surface</p>	<p>Apedal, with planar voids, chambers, channels and vughs. 10% total porosity. Groundmass greyish-brown. Burnt daub (mostly <1 mm, one 4 x 5 mm). Cylinder-shaped infilling (0.5 x 2 cm) with internal angular blocky structure (peds 3–5 mm) composed of dark brown soil.</p>	<p>Microstructures (complex):</p> <ul style="list-style-type: none"> • Subangular blocky (20% of microstructures): moderately separated, randomly arranged, ±accommodated coarse sand to gravel size peds (0.5–5 mm); • Spongy (80% of microstructures): poorly to well separated. <p>Total pore space 10%:</p> <ul style="list-style-type: none"> • Planar voids (20% of pore space): width 250 µm, length <1 cm; • Channels (30% of pore space): medium sand size (250 µm); 	<p>c/f limit: 5 µm; ratio 2:3; close to single-spaced porphyric distribution.</p> <p>Coarse minerals (>99% of coarse groundmass):</p> <ul style="list-style-type: none"> • Quartz (90% of coarse minerals): smooth, angular to subspherical; predominantly silt size (5–50 µm, 90% of quartz), very few very fine grains (50–100 µm, <2% of quartz). • Burnt daub (10% of coarse minerals): orange to yellow (OIL); smooth, subangular to platy; up to coarse sand size (<1 mm); one large angular fragment (4 x 5 mm); composed of silt size quartz (5–50 µm); undifferentiated 	<p>Crystalline</p> <ul style="list-style-type: none"> • Micrite coatings (on 30% of planar and packing void walls): continuous, nonlaminated, equigranular; thickness silt to fine sand size (10–125 µm); occasional crystal needling. • Calcite infillings (two instances): vermiform; dense incomplete; within channels (<1 mm). <p>Amorphous</p> <ul style="list-style-type: none"> • Fe nodules (<1% of groundmass): spherical to mammilate; very fine to medium sand size (50–250 µm).

Sample	Macroscopic observations	Microstructure and porosity	Groundmass	Pedofeatures
		<p>superimposed on microstructures;</p> <ul style="list-style-type: none"> Chambers (10% of pore space): up to very coarse sand size (<1.5 mm); Vughs (30% of pore space): up to coarse sand size (<1 mm). 	<p>b-fabric.</p> <p>Coarse organics (<1% of coarse groundmass):</p> <ul style="list-style-type: none"> Charcoal (90% of coarse organics): dull black (OIL); rectangular, with sharp boundaries; predominantly silt to fine sand size (5–200 µm); particularly concentrated within melanised aggregates. <p>Micromass: dark brown (PPL); weakly expressed calcitic crystallitic b-fabric; black punctuations.</p>	<p>Fabric</p> <ul style="list-style-type: none"> Infilling (0.5 x 2 cm): dense incomplete; moderately to well separated angular blocky structure (peds <2.5 mm); groundmass c.f. soil; with undifferentiated, melanised b-fabric <p>Excrement</p> <ul style="list-style-type: none"> Microgranular infillings: loose continuous; spherical to mammilate; dense microaggregates; colour and composition c.f. soil matrix; within channels and chambers.
<p>NB13[3]/3B: Layer B, >50 cm below surface</p>	<p>More pedal than immediately above. Subangular blocky peds (<1.5 cm) with planar voids, chambers, channels and vughs. Total porosity 5%. Groundmass greyish-brown. Daub fragments (mostly <1 mm, one 3 x 4 mm) and melanised infillings.</p>	<p>Microstructures (complex):</p> <ul style="list-style-type: none"> Subangular blocky (50% of microstructures): moderately separated, randomly arranged, ±accommodated coarse sand to gravel size peds (1–5 mm); Spongy (20% of microstructures): poorly to well separated; Granular (30% of microstructures): well separated; compound packing voids, associated with chambers. <p>Total pore space 10%:</p> <ul style="list-style-type: none"> Planar voids (20% of pore space): width 250 µm, length <2 cm; 	<p>c/f limit: 5 µm; ratio 2:3; close to single-spaced porphyric distribution.</p> <p>Coarse minerals (>99% of coarse groundmass):</p> <ul style="list-style-type: none"> Quartz (90% of coarse minerals): smooth, angular to subspherical; predominantly silt size (5–50 µm, 90% of quartz), very few very fine grains (50–100 µm, <2% of quartz). Burnt daub (10% of coarse minerals): orange to yellow (OIL); smooth, subangular to platy; up to coarse sand size (<1 mm); one large angular fragment (3 x 4 mm); composed of silt size quartz (5–50 µm); undifferentiated b-fabric. 	<p>Crystalline</p> <ul style="list-style-type: none"> Micrite coatings (on 30% of planar void, chamber and packing void walls): continuous, nonlaminated, equigranular; thickness silt to fine sand size (10–125 µm); occasional crystal needling. <p>Amorphous</p> <ul style="list-style-type: none"> Fe nodules (<1% of groundmass): spherical to mammilate; very fine to medium sand size (50–250 µm). <p>Fabric</p> <ul style="list-style-type: none"> Infillings (3 x 4 mm and 2 x 10 mm): dense complete; crescentic (alternating bands of calcitic

Sample	Macroscopic observations	Microstructure and porosity	Groundmass	Pedofeatures
		<ul style="list-style-type: none"> Channels (40% of pore space): medium sand size (250 µm); superimposed on microstructures; Chambers (10% of pore space): up to very coarse sand size (<1.5 mm); Vughs (25% of pore space): up to medium sand size (<250 mm). 	<p>Coarse organics (<1% of coarse groundmass):</p> <ul style="list-style-type: none"> Charcoal: dull black (OIL); rectangular, with sharp boundaries; predominantly silt to fine sand size (5–200 µm). <p>Micromass: dark brown (PPL); weakly expressed calcitic crystallitic b-fabric; black punctuations.</p>	<p>crystallitic and undifferentiated b-fabrics).</p> <p>Excrement</p> <ul style="list-style-type: none"> Microgranular infillings: loose continuous; spherical to mammilate; dense microaggregates; colour and composition c.f. soil matrix; within channels and chambers.
<p>NB13[3]/4A: Layer B, >55 cm below surface</p>	<p>Apedal, with planar voids, chambers, channels and vughs, and loose packing voids (peds 1–3 mm). 20% total porosity. Groundmass greyish-brown. Burnt daub (2–5 mm). Cylinder-shaped infilling (0.4 x 1.2 cm) with internal angular blocky structure (peds 3–5 mm) composed of dark brown soil.</p>	<p>Microstructures (complex):</p> <ul style="list-style-type: none"> Subangular blocky (10% of microstructures): moderately separated, randomly arranged, ±accommodated; up to very coarse sand size peds (<2 mm); Vughy to spongy (70% of microstructures): poorly to well separated; Granular (20% of microstructures): well separated; compound packing voids; up to very coarse sand size peds (<2 mm). <p>Total pore space 20%:</p> <ul style="list-style-type: none"> Planar voids (30% of pore space): width <250 µm, length <1.5 cm; Channels (40% of pore space): 	<p>c/f limit: 5 µm; ratio 2:3; close to single-spaced porphyric distribution.</p> <p>Coarse minerals (>95% of coarse groundmass):</p> <ul style="list-style-type: none"> Quartz (90% of coarse minerals): smooth, angular to subspherical; predominantly silt size (5–50 µm, 90% of quartz), very few very fine grains (50–100 µm, <2% of quartz). Burnt daub (10% of coarse minerals): orange to yellow (OIL); smooth, subangular to platy; up to gravel size (<5 mm); planar voids partially filled with amorphous organic matter; composed of silt size quartz (5–50 µm); undifferentiated b-fabric. <p>Coarse organics (<1% of coarse groundmass):</p> <ul style="list-style-type: none"> Charcoal: dull black (OIL); rectangular, with sharp boundaries; silt to fine sand 	<p>Crystalline</p> <ul style="list-style-type: none"> Micrite coatings (on 10% of planar void walls): continuous, nonlaminated, equigranular; thickness silt to fine sand size (10–125 µm); occasional crystal needling. <p>Amorphous</p> <ul style="list-style-type: none"> Fe nodules (<1% of groundmass): spherical to mammilate; very fine to medium sand size (50–250 µm). <p>Fabric</p> <ul style="list-style-type: none"> Infilling (0.4 x 1.2 cm): dense complete; well separated angular blocky structure (peds <2.5 mm); groundmass c.f. soil; undifferentiated, melanised b-fabric.

Sample	Macroscopic observations	Microstructure and porosity	Groundmass	Pedofeatures
		<p>up to medium sand size (<375 µm); superimposed on microstructures;</p> <ul style="list-style-type: none"> Vughs (30% of pore space): up to coarse sand size (<500 µm). 	<p>size (5–200 µm); particularly concentrated within melanised aggregates.</p> <p>Micromass: dark brown (PPL); weakly expressed calcitic crystallitic b-fabric; black punctuations.</p>	<p>Excrement</p> <ul style="list-style-type: none"> Microgranular infillings: loose continuous; spherical to mammilate; dense microaggregates; colour and composition c.f. soil matrix; within channels and chambers.
<p>NB13[3]/4B: Layer B, >65 cm below surface</p>	<p>Apedal, with planar voids, chambers, channels and vughs. <10% total porosity. Groundmass greyish-brown. Burnt daub (1 mm). Dense, dark brown infilling.</p>	<p>Microstructures (complex):</p> <ul style="list-style-type: none"> Vughy to spongy (70% of microstructures): poorly to well separated; Granular (30% of microstructures): well separated; compound packing voids; up to coarse sand size peds (<1 mm). <p>Total pore space 10%:</p> <ul style="list-style-type: none"> Planar voids (10% of pore space): width <250 µm, length <1.5 cm; Channels (70% of pore space): up to medium sand size (<375 µm); superimposed on microstructures; Vughs (20% of pore space): up to coarse sand size (<500 µm). 	<p>c/f limit: 5 µm; ratio 2:3; close to single-spaced porphyric distribution.</p> <p>Coarse minerals (>95% of coarse groundmass):</p> <ul style="list-style-type: none"> Quartz (95% of coarse minerals): smooth, angular to subspherical; predominantly silt size (5–50 µm, 90% of quartz), very few very fine grains (50–100 µm, <2% of quartz). Daub (5% of coarse minerals): yellow (OIL); smooth, subangular to platy; up to very coarse sand size (<1 mm); planar voids partially filled with amorphous organic matter; composed of silt size quartz (5–50 µm); undifferentiated b-fabric. <p>Coarse organics (<1% of coarse groundmass):</p> <ul style="list-style-type: none"> Charcoal: dull black (OIL); rectangular, with sharp boundaries; silt to fine sand size (5–200 µm); particularly concentrated within melanised 	<p>Crystalline</p> <ul style="list-style-type: none"> Micrite coatings (on 10% of planar void walls): continuous, nonlaminated, equigranular; thickness silt to fine sand size (10–125 µm); occasional crystal needling. Calcite impregnations (<2% of groundmass): weakly to moderately impregnative; medium to coarse sand size (0.5–2 mm). <p>Amorphous</p> <ul style="list-style-type: none"> Fe nodules (<1% of groundmass): spherical to mammilate; very fine to medium sand size (50–250 µm). <p>Fabric</p> <ul style="list-style-type: none"> Infillings (<1 mm): dense complete; groundmass c.f. soil, but c/f ratio 1:1 and more frequent coarse silt (30–50 µm); undifferentiated, melanised

Sample	Macroscopic observations	Microstructure and porosity	Groundmass	Pedofeatures
			aggregates. Micromass: dark brown (PPL); weakly expressed calcitic crystallitic b-fabric; black punctuations.	b-fabric; micrite coatings. Excrement <ul style="list-style-type: none"> • Microgranular infillings: loose continuous; spherical to mammilate; dense microaggregates; colour and composition c.f. soil matrix; within channels and chambers.

Table 8. Macroscopic and micromorphological descriptions of Pit, Sondazh 1. Soil profile described from top to bottom.

Slide	Macroscopic observations	Microstructure and porosity	Groundmass	Pedofeatures
NB13[4]/1A: Fill, 120 cm below surface	Apedal. Frequent channels, vughs, chambers and planar voids (<3.5 cm long). 10% total porosity. Groundmass dark greyish-brown. Pottery/daub (>6 x 9 mm) and white to yellow inclusions of unknown type. A large vertical channel (5–9 mm wide) with sharp boundaries and 'billowing' infilling composed of dark brown and semi-opaque soil.	<p>Microstructures (complex):</p> <ul style="list-style-type: none"> Subangular blocky (10% of microstructures): poorly to moderately separated, accommodated up to gravel size peds (<3 mm); Spongy (80% of microstructures): poorly to moderately separated; Granular (10% of microstructures): compound packing voids. <p>Total pore space 10%:</p> <ul style="list-style-type: none"> Planar voids (10% of pore space): width <250 µm, length <2 cm; Channels (40% of pore space): medium sand size (250–500 µm); Chambers (10% of pore space): coarse sand to gravel size (0.5–3 mm); Vughs (40% of pore space): up to medium sand size (250 µm). 	<p>c/f limit: 5 µm; ratio 2:3; close to single-spaced porphyric distribution.</p> <p>Coarse minerals (90% of coarse groundmass):</p> <ul style="list-style-type: none"> Quartz (>80% of coarse minerals): smooth, angular to subspherical; predominantly silt size (5–50 µm, >95% of quartz), very few very fine to fine sand size grains (50–200 µm, <2% of quartz) preferentially associated with chambers. Bone (one fragment, 3 x >6 mm): transparent (PPL), 1st order grey (XPL); fibrous, compact internal fabric. Burnt daub (15% of coarse minerals): orange and yellow (OIL); smooth, subangular to platy; predominantly up to gravel size (<2 mm); one large angular fragment (5 x 8 mm); composed of silt size quartz (5–50 µm); undifferentiated to calcitic crystallitic b-fabrics. Heterogeneous fragment (2 x >6 mm): smooth, cylindrical; yellow (PPL), speckled clayey b-fabric; angular quartz grain (<250 µm), brown plant tissue residues (125–375 µm) and shell fragments (<500 µm) parallel to the longitudinal axis. <p>Coarse organics (2% of coarse groundmass):</p> <ul style="list-style-type: none"> Plant tissue residues (20% of coarse organics): black to dark brown (PPL), 1st order birefringence (XPL); elongated; medium sand size (<375 µm). Charcoal (70% of coarse organics): dull black (OIL); rectangular, with sharp boundaries; silt to medium sand size (5–250 µm); several fragments 200–300 µm; in loose concentrations, higher abundance than in other contexts. <p>Micromass: dark brown (PPL); undifferentiated b-fabric; black punctuations.</p>	<p>Crystalline</p> <ul style="list-style-type: none"> Micrite coatings and hypoc coatings (on 10% of vughs and channels): continuous, nonlaminated, equigranular; thickness up to very fine sand size (<100 µm). <p>Amorphous</p> <ul style="list-style-type: none"> Fe nodules (<1% of groundmass): spherical, with sharp to diffuse boundaries; very fine to medium sand size (50–250 µm). <p>Fabric</p> <ul style="list-style-type: none"> Infilled vertical channel (width 5–9 mm): dense to porous complete infilling; groundmass c.f. surrounding matrix; diffuse melanised areas; very few fragments of charcoal (10–100 µm). <p>Excrement</p> <ul style="list-style-type: none"> Microgranular infillings: loose continuous; spherical to mammillate; dense microaggregates; colour and composition c.f. soil matrix; within channels and chambers.
NB13[4]/1B: Fill, >125 cm below surface	Apedal. Frequent channels, vughs, chambers and planar voids (<3.5 cm long). 15% total porosity. Groundmass dark greyish-brown. Pottery/daub (>5 x 8 mm). A large vertical channel (4–7 mm wide) with sharp boundaries and infilled with dark brown and porous soil.	<p>Microstructures (complex):</p> <ul style="list-style-type: none"> Subangular blocky (10% of microstructures): poorly to moderately separated, accommodated up to very coarse sand size peds (<2 mm); 	<p>c/f limit: 5 µm; ratio 2:3; close to single-spaced porphyric distribution.</p> <p>Coarse minerals (95% of coarse groundmass):</p> <ul style="list-style-type: none"> Quartz (90% of coarse minerals): smooth, angular to subspherical; predominantly silt size (5–50 µm, >95% of quartz), very 	<p>Crystalline</p> <ul style="list-style-type: none"> Micrite coatings and hypoc coatings (on 10% of vughs and channels): continuous, nonlaminated, equigranular; thickness up to very fine sand size (<100 µm). <p>Amorphous</p>

Slide	Macroscopic observations	Microstructure and porosity	Groundmass	Pedofeatures
		<ul style="list-style-type: none"> Spongy (60% of microstructures): poorly to moderately separated; Granular (30% of microstructures): compound packing voids. <p>Total pore space 15%:</p> <ul style="list-style-type: none"> Planar voids (10% of pore space): width <250 µm, length <2 cm; Channels (40% of pore space): medium sand size (250–1000 µm): loose granular infillings; Chambers (10% of pore space): up to gravel size (<3 mm); Vughs (40% of pore space): up to medium sand size (<250 µm). 	<p>few very fine to fine sand size grains (50–200 µm, <2% of quartz) preferentially associated with chambers.</p> <ul style="list-style-type: none"> Burnt daub (10% of coarse minerals): orange and yellow (OIL); smooth, subangular to platy; predominantly up to gravel size (<2 mm); one large angular fragment (5 x 8 mm); composed of silt size quartz (5–50 µm); undifferentiated to calcitic crystallitic b-fabrics. <p>Coarse organics (2% of coarse groundmass):</p> <ul style="list-style-type: none"> Charcoal: dull black (OIL); rectangular, with sharp boundaries; predominantly silt to medium sand size (5–250 µm); several fragments 500–2500 µm, with cell structures; in loose concentrations, higher abundance than in other contexts. <p>Micromass: dark brown (PPL); undifferentiated b-fabric; black punctuations.</p>	<ul style="list-style-type: none"> Fe nodules (<1% of groundmass): spherical, with sharp to diffuse boundaries; very fine to medium sand size (50–250 µm). <p>Fabric</p> <ul style="list-style-type: none"> Vertical channel (width 4–7 mm): dense to porous complete infilling; groundmass c.f. surrounding matrix; diffuse melanised areas; very few fragments of charcoal (<200 µm). <p>Excrement</p> <ul style="list-style-type: none"> Microgranular infillings: loose continuous; spherical to mammillate; dense microaggregates; colour and composition c.f. soil matrix; within channels and chambers.
NB13[4]/2A: Horizon B, 125 cm below surface	<p>Poorly separated angular blocky structure (peds >2.5 cm) with intrapedal porous structures. Chambers (0.2–1.5 cm), planar voids, and channels. 20% overall porosity. Groundmass yellowish-brown. Large interconnected chambers (1.5 cm across) loosely infilled with granular particles. Darker brown aggregates (<5 mm) embedded in the matrix.</p>	<p>Microstructures (complex):</p> <ul style="list-style-type: none"> Angular blocky (10% of microstructures): poorly to moderately separated, accommodated up to very coarse sand size peds (<1.5 cm); Spongy (70% of microstructures): poorly to moderately separated; Granular (20% of microstructures): compound 	<p>c/f limit: 5 µm; ratio 3:7; single to double-spaced porphyric distribution.</p> <p>Coarse minerals (99% of coarse groundmass):</p> <ul style="list-style-type: none"> Quartz (>95% of coarse minerals): smooth, angular to subspherical; predominantly silt size (5–50 µm, >95% of quartz), very few very fine to fine sand size grains (50–200 µm, <2% of quartz). Burnt daub (one specimen): orange (OIL); smooth, spherical; medium sand size (250 µm); composed of silt size quartz 	<p>textural, depletion, crystalline, amorphous, cryptocrystalline, fabric, excrement</p> <p>Crystalline</p> <ul style="list-style-type: none"> Micrite coatings (on 10% of vugh and channel walls): continuous, nonlaminated, equigranular; thickness up to very fine sand size (<100 µm). <p>Amorphous</p> <ul style="list-style-type: none"> Fe nodules (<1% of groundmass): spherical, silt to medium sand size (5–500 µm).

Slide	Macroscopic observations	Microstructure and porosity	Groundmass	Pedofeatures
		<p>packing voids.</p> <p>Total pore space 20%:</p> <ul style="list-style-type: none"> • Planar voids (5% of pore space): width <250 µm, length <2.5 cm; • Channels (10% of pore space): medium sand size (250–375 µm); loose granular infillings; • Chambers (80% of pore space): gravel size (0.2–1.5 cm); • Vughs (5% of pore space): up to medium sand size (<250 µm). 	<p>(5–50 µm); undifferentiated b-fabric.</p> <p>Coarse organics (1% of coarse groundmass):</p> <ul style="list-style-type: none"> • Charcoal: dull black (OIL), rectangular, with sharp boundaries; medium sand size (250–375 µm); within melanised fabric units. <p>Micromass: brown (PPL); calcitic crystallitic b-fabric.</p>	<p>Fabric</p> <ul style="list-style-type: none"> • Infillings (10% of groundmass): subangular; up to gravel size (<4 mm); groundmass $c/f_{5\mu m}$ ratio 4:6, with close to single-spaced porphyric distribution; composed of silt size quartz (30–50 µm more frequent than in the surrounding matrix) and very few fragments of charcoal (250–375 µm); undifferentiated b-fabrics with black punctuations; occasionally infilling channels. <p>Excrement</p> <ul style="list-style-type: none"> • Microgranular infillings: loose continuous; spherical to mammilate; dense microaggregates; colour and composition c.f. soil matrix; within channels and chambers.
<p>NB13[4]/2B: Horizon B, >130 cm below surface</p>	<p>Poorly separated angular blocky structure (peds >4 cm) with intrapedal porous structures. Chambers (0.2–1.5 cm), planar voids, and channels. 10% overall porosity. Groundmass yellowish-brown. Large chamber (0.4 x 1.5 cm) infilled with dark brown soil. Darker brown aggregates (0.1–1.5 cm) embedded in the matrix.</p>	<p>Microstructures (complex):</p> <ul style="list-style-type: none"> • Angular blocky (10% of microstructures): poorly to moderately separated, accommodated up to very coarse sand size peds (<1.5 cm); • Spongy (70% of microstructures): poorly to moderately separated; • Granular (20% of microstructures): compound packing voids. <p>Total pore space 10%:</p> <ul style="list-style-type: none"> • Planar voids (70% of pore space): width <250 µm, 	<p>c/f limit: 5 µm; ratio 1:4; single to open porphyric distribution.</p> <p>Coarse minerals (99% of coarse groundmass):</p> <ul style="list-style-type: none"> • Quartz (>95% of coarse minerals): smooth, angular to subspherical; predominantly silt size (5–50 µm, >95% of quartz), very few very fine to fine sand size grains (50–200 µm, <2% of quartz). <p>Coarse organics (1% of coarse groundmass):</p> <ul style="list-style-type: none"> • Charcoal (2% of coarse organics): dull black (OIL), rectangular, with sharp boundaries; medium sand size (500–375 µm); within melanised fabric unit. <p>Micromass: brown (PPL); calcitic crystallitic b-fabric.</p>	<p>textural, depletion, crystalline, amorphous, cryptocrystalline, fabric, excrement</p> <p>Crystalline</p> <ul style="list-style-type: none"> • Micrite coatings (on 10% of vugh and channel walls): continuous, nonlaminated, equigranular; thickness up to very fine sand size (<100 µm). <p>Amorphous</p> <ul style="list-style-type: none"> • Fe nodules (<1% of groundmass): spherical, silt to medium sand size (5–500 µm). <p>Fabric</p> <ul style="list-style-type: none"> • Infillings (10% of groundmass): subangular; coarse sand to gravel size (0.1–1.5 cm); groundmass $c/f_{5\mu m}$ ratio 2:3, with close to single-spaced porphyric distribution; composed of silt

Slide	Macroscopic observations	Microstructure and porosity	Groundmass	Pedofeatures
		<p>length <3 cm;</p> <ul style="list-style-type: none"> • Channels (20% of pore space): medium sand size (250–375 µm); loose granular infillings. • Vughs (10% of pore space): up to medium sand size (<250 µm). 		<p>size quartz (30–50 µm more frequent than in the surrounding matrix) and very few fragments of charcoal (250–375 µm); undifferentiated b-fabrics with black punctuations.</p> <p>Excrement</p> <ul style="list-style-type: none"> • Microgranular infillings: loose continuous; spherical to mammilate; dense microaggregates; colour and composition c.f. soil matrix; within channels and chambers.

Table 9. Results of the charcoal line/area counting (explained in Chapter 3). 'Punctuations' refers to black micron-sized punctuations in the micromass; only their presence/absence is noted. Silt-size charcoal particles were not counted, but their relative abundances were noted. Brackets indicate that the observed category is present but in low quantities.

Context	Sample	Punctuations (<5 µm)	ss (5–50 µm)	vfs (50–100 µm)	fs (100–200 µm)	ms (200–500 µm)	cs (500–1000 µm)
Cherno-zem	NB13[1]/1	yes	frequent	21	9	0	0
	NB13[1]/2	yes	frequent	15	5	0	0
	NB13[1]/3	(yes)	few	5	5	0	0
Burnt house (TP 1/3)	NB13[2]/1 A	yes	frequent	23	9	2	0
	NB13[2]/1 B	yes	frequent	26	3	0	0
	NB13[2]/2 A	yes	frequent	19	3	0	0
	NB13[2]/2 B	yes	common	17	6	2	0
Unburnt house (TP 1/4)	NB13[3]/1 A	yes	frequent	36	7	0	0
	NB13[3]/1 B	yes	frequent	40	7	1	0
	NB13[3]/2 A	yes	common	26	3	1	0
	NB13[3]/2 B	yes	common	41	6	0	0
	NB13[3]/3 A	yes	common	29	7	0	0
	NB13[3]/3 B	yes	common	40	10	2	0
	NB13[3]/4 A	yes	common	34	2	0	0
	NB13[3]/4 B	yes	common	31	6	1	0
Pit, Sondazh 1	NB13[4]/1 A	yes	many	133	40	23	0
	NB13[4]/1 B	yes	many	130	69	15	1
	NB13[4]/2 A	(yes)	(few)	6	4	0	0
	NB13[4]/2 B	(yes)	(few)	23	4	0	0