BAYERISCHES LANDESAMT FÜR DENKMAL PFLEGE

The *Bayerisches Landesamt für Denkmalpflege* Mapping System for Organic Materials on Metals and in Block Excavations – Guideline for Installation and Use

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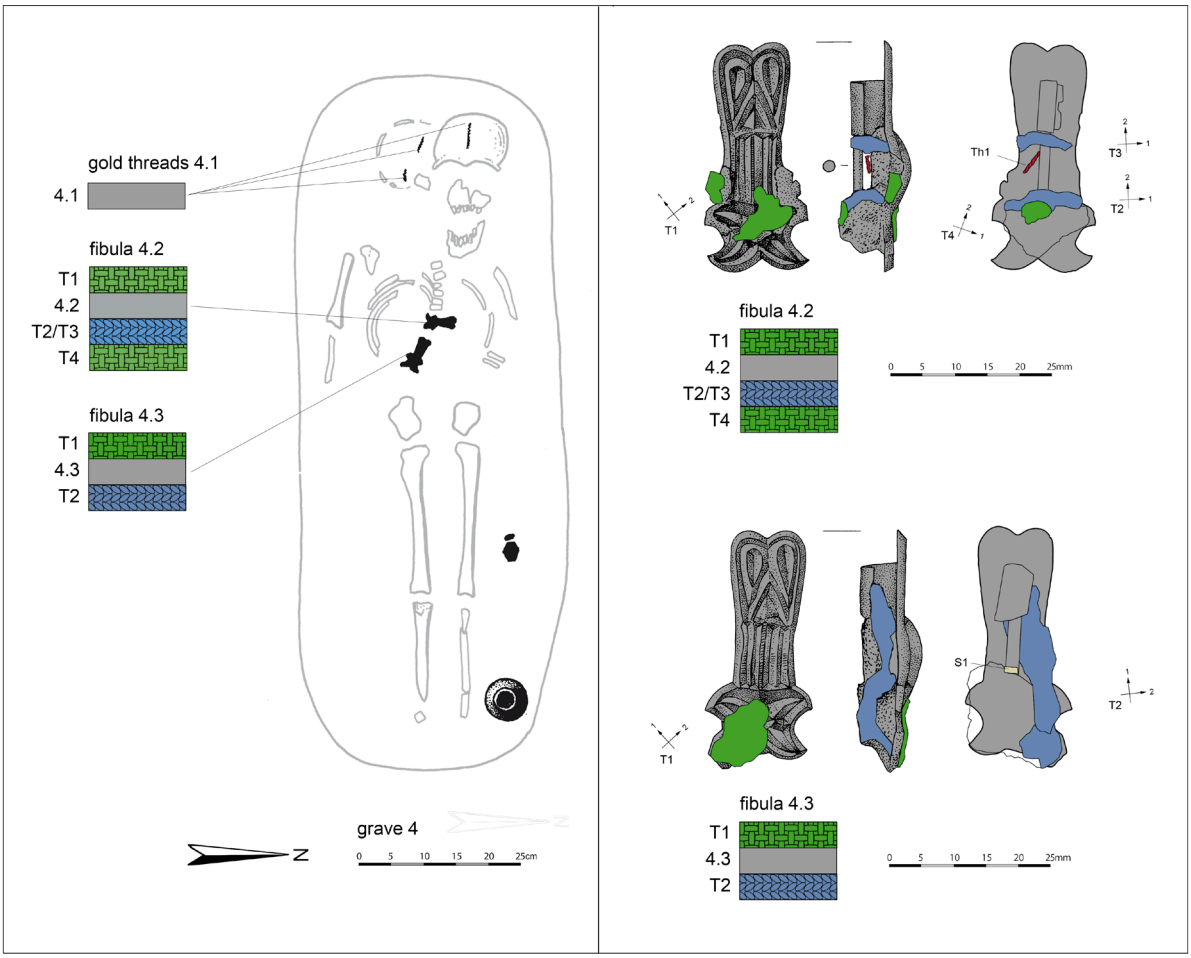


Fig. 1: Unterhaching, Munich, grave 4: area mapping and stratigraphic mapping of organic structures on the fibulas 4.2 and 4.3, as well as the grave plan (all images: Voß/Nowak-Böck, BLfD).

Contents:

1. General Introduction into the BLfD Mapping System

The BLfD mapping system was developed specifically for documentation and mapping of organic structures adhering to archaeological objects and for *in situ* block excavations.The mapping system uses a standardised way to represent materials and objects in area mapping and stratigraphic mapping. This includes specific colours, pictograms and short identifiers. The mapping system allows for a uniform documentation and presentation, and thus easy comparability of organic finds and structures from different excavations (see also 5.3 Bibliography). The mapping system is based on the programme Adobe Photoshop® (version CS3 or later, also Photoshop elements®). This documentation is provided to make using the system as easy as possible, providing all necessary information. Helpful plug-ins for the programme can be downloaded free of cost in the download area of the BLfD homepage: https://www.blfd.bayern.de/mam/information_und_service/fachanwender/mappingsystem_organic_materials_blfd_2024.zip

If you are interested to hear about future updates or developments, please send an email to Helmut.Voss@blfd.bayern.de.

The basic data of the mapping system can be found in the following files:

- 'default mapping template.psd' (in connection with 'mapping colour space.csf'): a standardised template with all necessary pre-selections such as resolution (600 dpi), colour mode (Adobe RGB) etc.
- 'brushes for mapping organic materials.abr' with scales, north arrows, thread system crosses etc. for area mapping and the defined pictograms for stratigraphy mapping
- 'colours for mapping organic materials.aco' containing 12 pre-set colours complementing each other; the colour selection ensures accurate rendering both on screen (Adobe-RGB) and in print (usually CMYK)

In addition to these basic files, the system provides several automated actions for area and stratigraphy mapping. These are plug-ins for the programme ensuring a quick and consistent result.

- 'area mapping.atn' with standardised contour and fill colours
- 'mapping.atn' for manual setting of contour and fill colours
- “link to pictograms” important for linking pictograms with actions
- 'stratigraphy mapping.atn' in connection with the file 'pictograms for Adobe RGB.psd' and either '2 in layer stratigraphy editor.atn' and 'page for 2 in layer stratigraphy.psd' or '3 in layer stratigraphy editor.atn' and 'page for 3 in layer stratigraphy.psd' for drawing stratigraphy charts
- 'convert to BW 75% opacity.atn' for the automated transformation of photos or drawings to use as mapping base

- 'text label options.atn' for consistent labels (font type and size, line height and text alignment)
- 'folder structure.atn' for consistent and clear layer structure

The ‘calculator for image sizes.xls' helps in re-sizing photos or drawings to be used as the mapping base images to the appropriate size.

2. How to Install the Mapping System Files

- Download all files and plug-ins for the mapping system from the download area of the BLfD website into a folder on your computer.
- Open Photoshop.
- Select the brush tool. This lets an options bar appear. Click on the small arrow beside the brush and then the little gear in the box that opened up. Select ‘Import Brushes…’. Load the brushes file ‘brushes for mapping organic materials.abr’.
- Add the colours for mapping in the same way: In the Window panel, select the swatches, and click the hamburger menu. Select ‘Import swatches’ to load 'colours for mapping organic materials.aco' into the programme.
- In the Window section, you also find the 'Actions' panel. Use this to load all eight action files: 'area mapping.atn', 'mapping.atn', 'stratigraphy mapping.atn', '2 in layer stratigraphy editor.atn', '3 in layer stratigraphy editor.atn', 'convert to BW 75% opacity.atn', 'text label options.atn' and 'folder structure.atn'.
- Load the file 'mapping colour space.csf' through the menu under Edit > Color Settings.
- To enable the automated actions to access the necessary PSD files, adjustments must be made to the ‘Link to pictograms’ action. To do this, open the ‘Actions’ panel and deactivate the ‘Button mode’ if necessary. Then open the action ‘Link to pictograms’, click the hamburger menu and select ‘Record again’. Now open the storage location of the mapping system and select the file ‘pictograms for Adobe RGB.psd’.
- Repeat the procedure for the ‘2 in layer stratigraphy editor’ and the ‘3 in layer stratigraphy editor’ using the corresponding PSD file.
- You can now exit the programme.

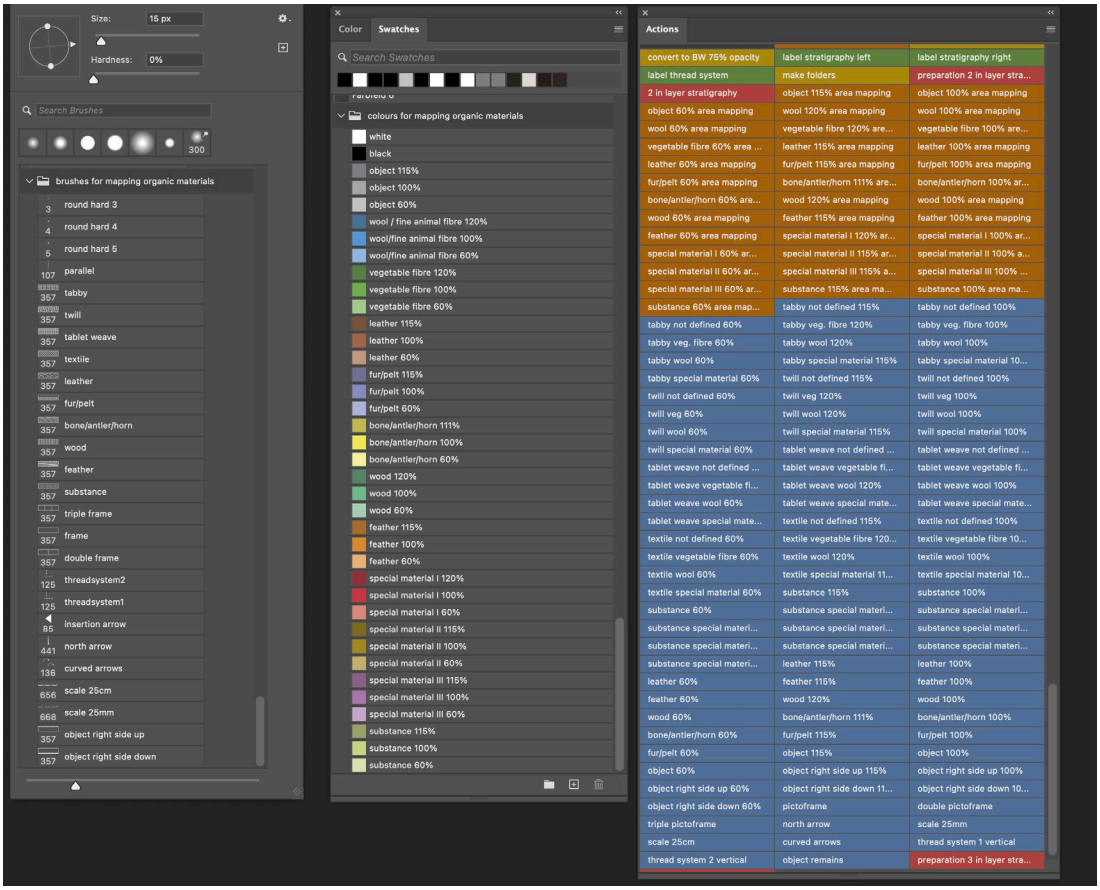


Fig. 2: Standardised 'brushes', 'colour swatches', and automated 'actions'.

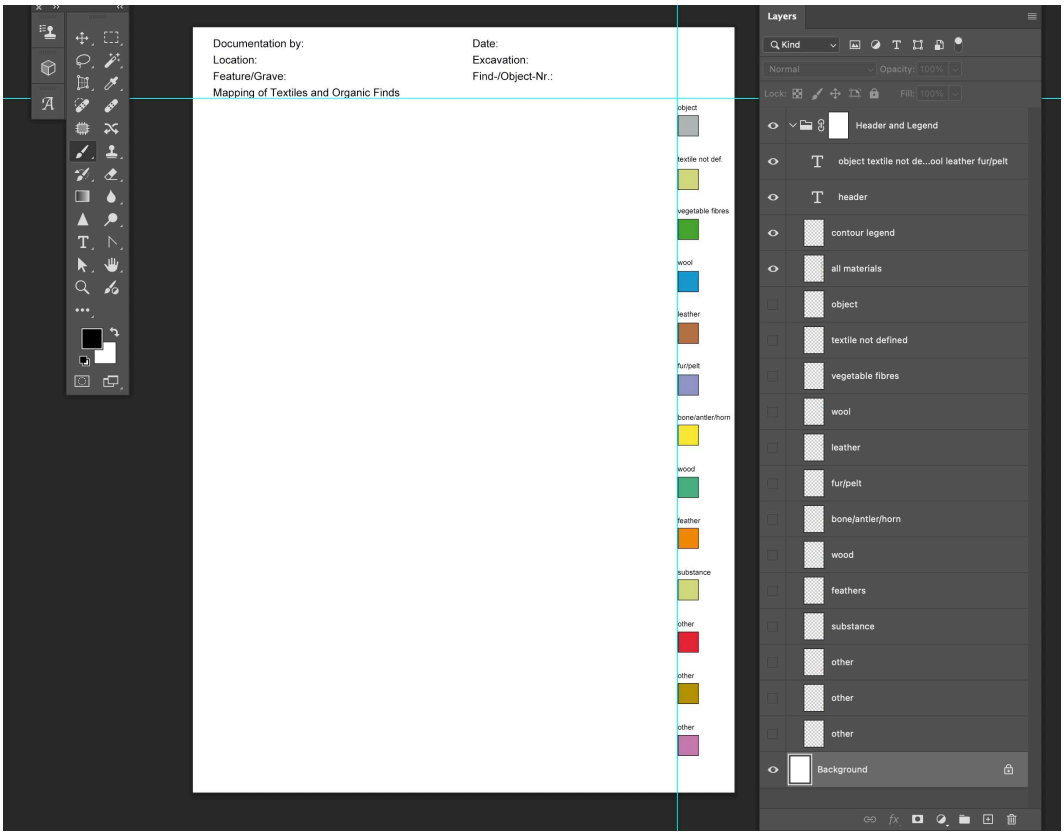


Fig. 3: Default mapping template.

3. How to Use the Mapping System

After installation of all the files, you can start mapping using the system.

3.1 Basic Preferences

- Open the photoshop file 'default mapping template.psd'. This is a blank file with all the necessary pre-sets such as width, height, resolution, colour mode, and background set as the standard values. The colour list on the right side allows a quick survey of the charted materials for a large amount of mappings.
- All layer fields are activated as default. If necessary, they can all be deactivated by going to the tab ‘Layers’ and clicking the eye to the left of the layer ‘all materials’. Afterwards they can be activated individually as desired.
- Header texts and legends for the colour fields can be changed or added to as necessary.
- For the alignment of stratigraphy columns, it is recommended to use predefined gridlines. With Photoshop® CS4–CS6, they can be set via ‘Edit > Preferences > Guides, Grid & Slices’ (set Grid settings as Gridline every 16.4 mm, Subdivisions: 4 and select the dots as grid style). Then select ‘View > Show > Grid and View > Snap to > Grid’. With Photoshop® CC, they can be set via ‘Photoshop 20XX > Preferences > Guides, Grid & Slices’ (set Grid settings as Gridline every 16.4 mm, Subdivisions: 4 and select the dots as grid style). Then select ‘View > Show > Grid and View > Snap to > Grid’.
- For a consistent and clear arrangement of layers, the action ‘folder structure.atn’ can be used to generate a basic structure for each object (folder structure for find: stratigraphy, mapping front and back, basics).
- When working with the mapping actions, it is recommended that the document you are currently working on is the only open document in the programme; otherwise an action may accidentally run on the wrong document.

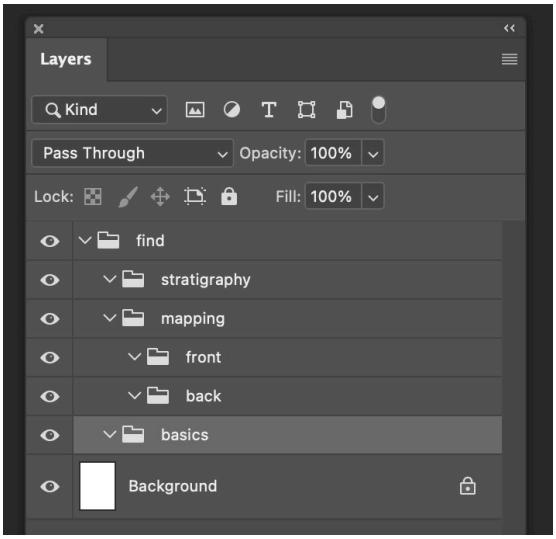


Fig. 4: Folder structure in layers.

3.2 Area Mapping Using the Predifined Colour Scheme

- Copy photos or drawings of front, back, and if applicable the side(s) of your find(s) into the default mapping template. Images should be skewed as little as possible. (If necessary, agree to the conversion into Adobe RGB.) In additional layers you can also add more drawings or X-ray images and arrange them to be superposed on the photographs. For mapping directly over a photograph, it can be helpful to use the action ‘convert to BW 75% opacity.atn’.
- Mapping basics (photos, drawings, x-ray images, ...) must absolutely be scaled to image size (for smaller finds, full size is usually used). You can use the simple Excel table ‘calculator for image sizes.xls‘ to find the correct scaling factor. Use the ‚Ruler Tool‘ to measure a known distance in the photograph (such as a scale) and use this measurement (distance measured) plus the desired length in the mapping (actual or image distance) to calculate the scaling factor in percent.
- For area mapping, first create the mapping outline of your find in grey colour (object colour 100%). If two or more objects are connected to each other, different shades of grey (object colour 60% or 115%) are used. For this first step, the outer contour of the object is masked using the polygonal lasso tool. (If necessary, de-activate the snap function under ‚View‘ for this.) Once the object outline is captured with the lasso tool, use the action ‚object 100% area mapping‘ to automatically fill the object and add a standardised contour line. Actions are easier to trigger if you switch to ‚Button Mode‘ in the action panel menu.
- Layers and groups generated by the actions can be renamed for a better overview.
- Proceed in this way for all of the organic substances on the find or in the block to map them. If several layers of the same material are lying over each other, use the colour grades (lighter and darker variants) for them. In some situations, the action ‘contour + filling’ may be necessary. Here, you can manually choose the colours for foreground (filling) and background (contour).
- Altogether, there are nine colours pre-set for the most common mineralised structures. Three additional ‘special colours’ can be used for rare materials, undefined textile layers, or for the marking of peculiar substances, as needed in the individual project (see fig. 5 and the table with defined colour values in addendix 5.2).
- Explanatory symbols such as small crosses for the alignment of the thread systems in textiles, curved arrows for marking the course of a layer, scale and north arrow are available both as brushes and as actions.

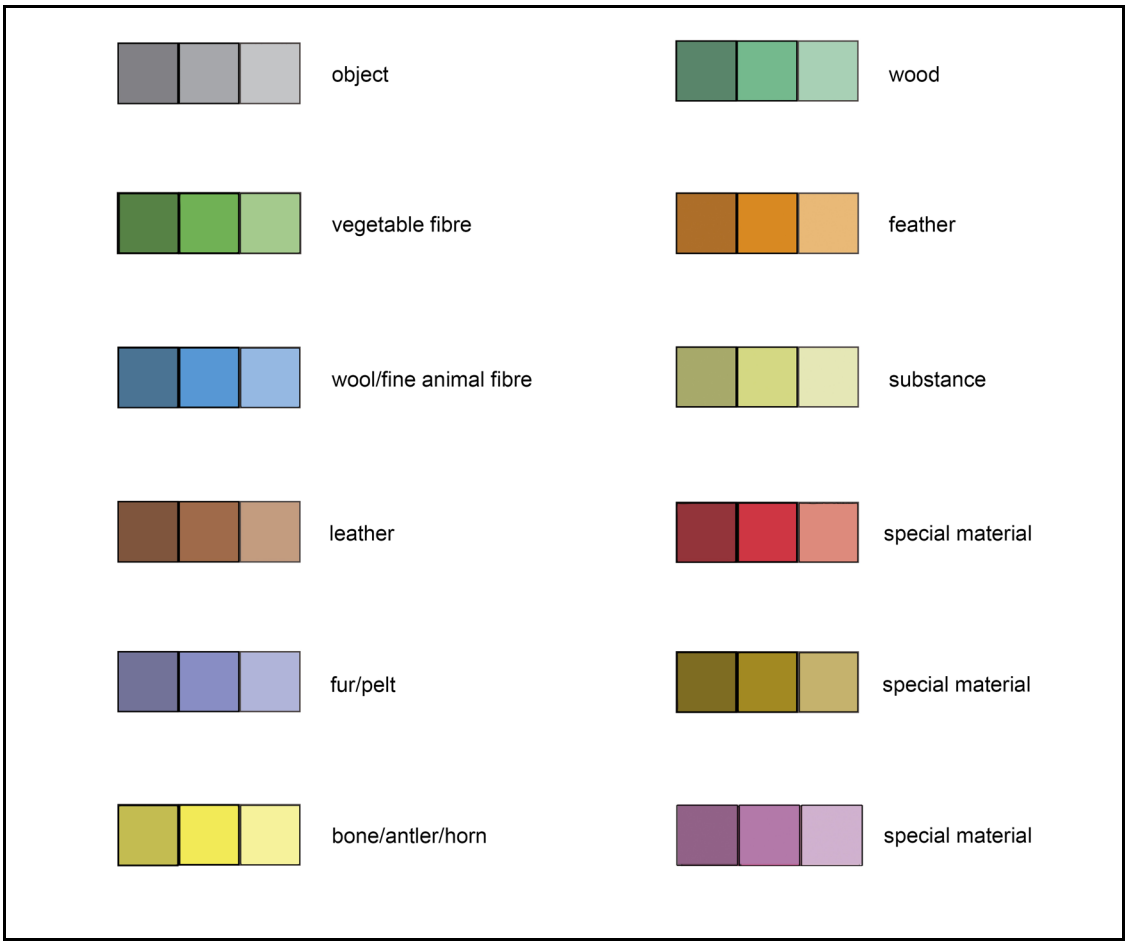


Fig. 5: Standardised colours with a light, a medium (standard) and a dark colour variant.

3.3 Stratigraphic Mapping Using the Predifined Colour Scheme and Pictograms

- Stratigraphic mapping shows the sequence of all layers covering the front and back of the surface of the object. Structures not covering an area of the object surface (such as individual plied yarns, for instance) are not included in this mapping type. In cases where layering is very complex, the stratigraphy mapping has to be done for several parts of the object or find block, and additional detail drawings and descriptions may be necessary.
- The object, shown in grey in the stratigraphy column, forms the basis of the stratigraphy. If its position and alignment in the feature are known, it is possible to indicate the right side through the pictogram with a thicker line.
- For the individual column parts in the stratigraphy, a combination of colours and pictograms are used. The most common combinations are included as pre-sets (see fig. 6).[1]
- The pictogram 'substance' can be combined with different colours, for instance with the colour for 'substance not defined'. It can also be used for a special material without a specific pictogram, such as botanical remains; for this it can be combined with a special colour.
- The combination possibilities of (special) colour and pictograms, including the 'substance' pictogram, the system can be adapted to suit the specific mapping project and its peculiarities.
- For the most common textiles, such as textiles in tabby, twill and tablet weave, specific textile pictograms are available.
- Further detailed information about fabrics can be added behind the corresponding part of the stratigraphy column. This can be used to indicate variations of a binding pattern (such as repp or herringbone twill) or additional information such as spin patterning, plissée, coarse or fine, and so on. (see appendix 5.1).[2]
- For undefined or very rare weave structures (such as samite or patterned weaves) as well as for non-woven textile structures (sprang, braids etc.) an additional non-specific textile symbol is available. This should be combined with the appropriate material colour and labelled for clarity.
- If one stratigraphy layer features several different materials, they should be indicated side by side with a split column part. For the individual combinations, the actions '2 in layer stratigraphy editor.atn' and '3 in layer stratigraphy editor.atn' are used to map the individual combinations. For this, use first 'preparation 2 in layer stratigraphy' or 'preparation 3 in layer stratigraphy' and then '2 in layer stratigraphy' or '3 in layer stratigraphy'.

[1] The combination ensures that the essential information is legible in black and white copies. For better legibility, the pictograms are not used in the area mapping: Often the individual areas to be mapped are very small, and pictograms would not be rendered legibly.

[2] This way of adding further information keeps the basic system simple and easy to read; it also allows for showing the different textile structures with different depths of information, which is often necessary. If many different types of textiles have to be mapped, it is also possible to use special colours for specific textile types.

- For the stratigraphy mapping of the individual layers, ‘stratigraphy mapping.atn’ contains pre-set combinations of colours and pictograms for speedy mapping. For each organic layer, the corresponding action can be chosen and activated.
- The stratigraphy column parts generated this way are placed on top of each other according to the layers of the find.
- When running actions for mapping, new layers are generated. For better clarity, they can be grouped together in layer groups. The layer groups can later be used in other files (for example in complete stratigraphies of objects in overview plans).

3.4 Labelling and Short Identifiers of Organic Structures

- For the identification and unambiguous linking of the mapped layers to the excavation documentation and, if applicable, to samples, each substance has to be labeled with a short identifier. These consists of a material indicator (T = textile, L = leather, W = wood, B = bone/antler/horn, F = fur/pelt, Ft = feather, S = substance, Th = thread) and a continuous number. The short identifier is placed in front of the corresponding stratigraphy column part.
- For consistent typography, labeling can be done through the action ‘text label options.atn’ providing standardised font, font sizes, line spacing and alignment.

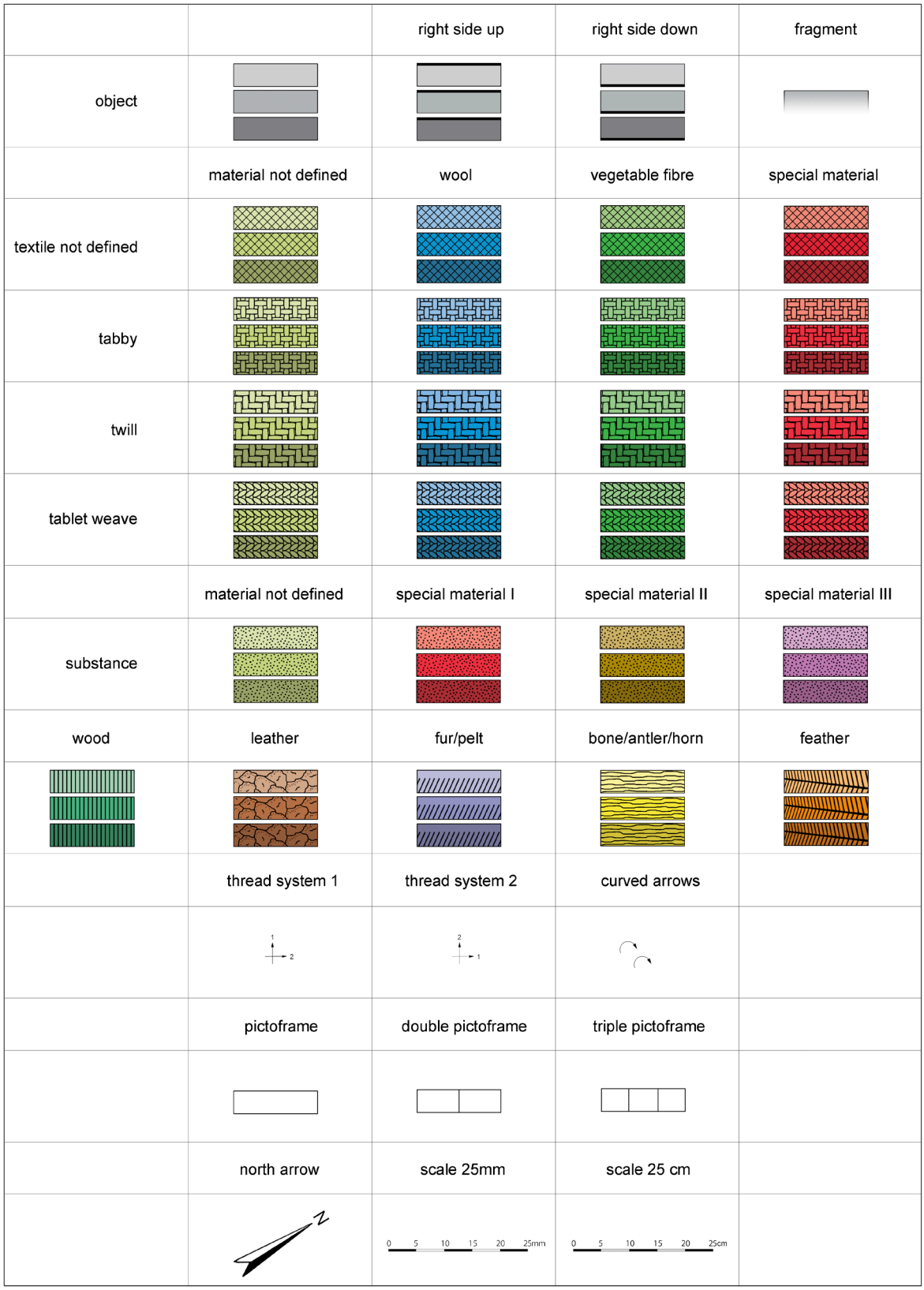


Fig. 6: Table with coloured pictograms for the stratigraphic mapping.

4. Usage Example

Woman's grave from Exampletown with

- fibula nr. 1.1 with repp fabric from linen T1 on the right side and undefined textile remains with spin patterning T2, leather strip L1 and conspicuously spread-out insect remains S1 on the back.
- knife nr. 1.2 with remains of the handle from horn on both sides B1 and fragments of the leather sheath L1; on the back of the leather plisséed fragments of a wool tabby fabric T1 and structures of a wool twill T2.

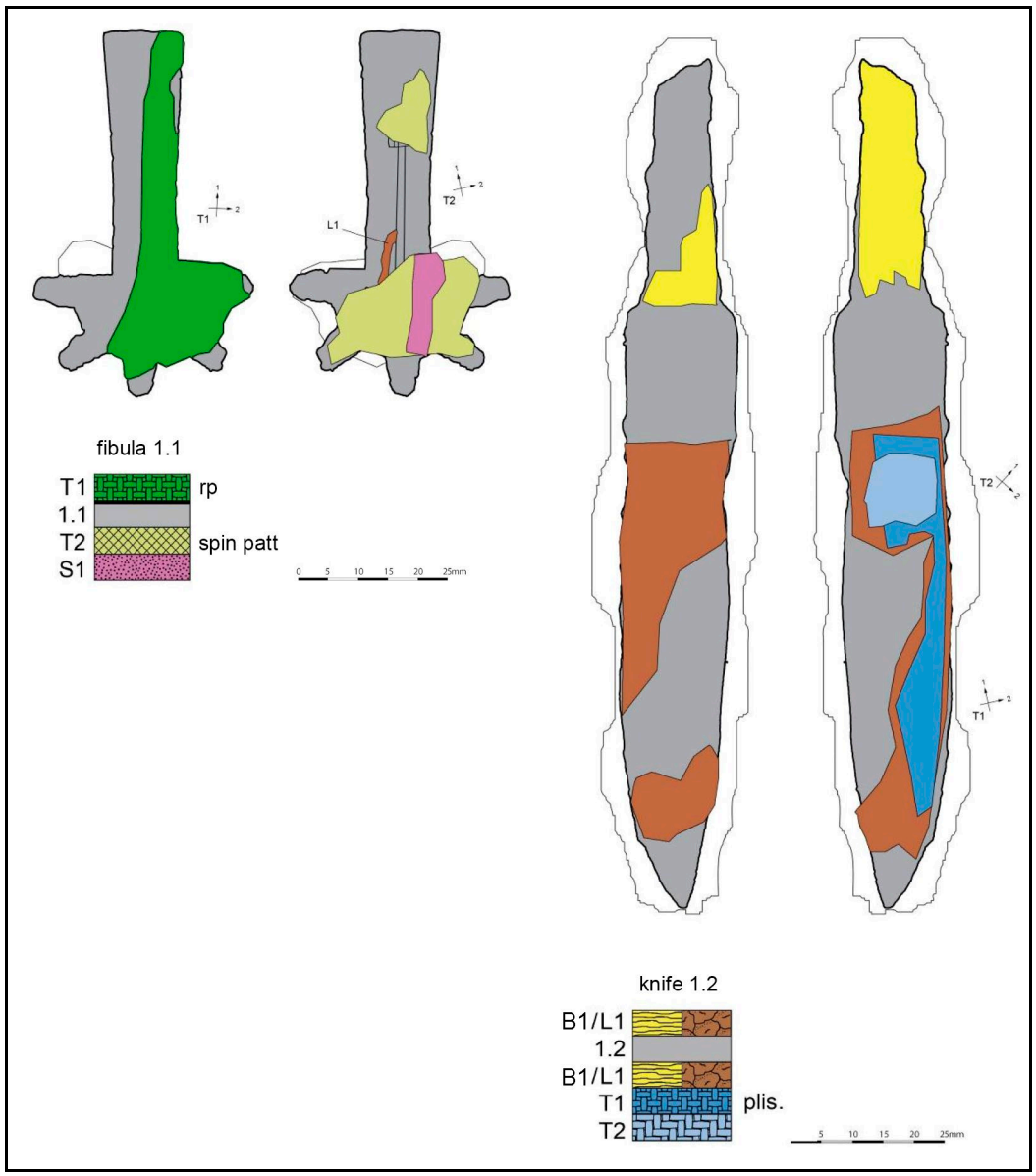


Fig. 7: Area mapping and stratigraphy mapping of fibula 1.1 and knife 1.2.

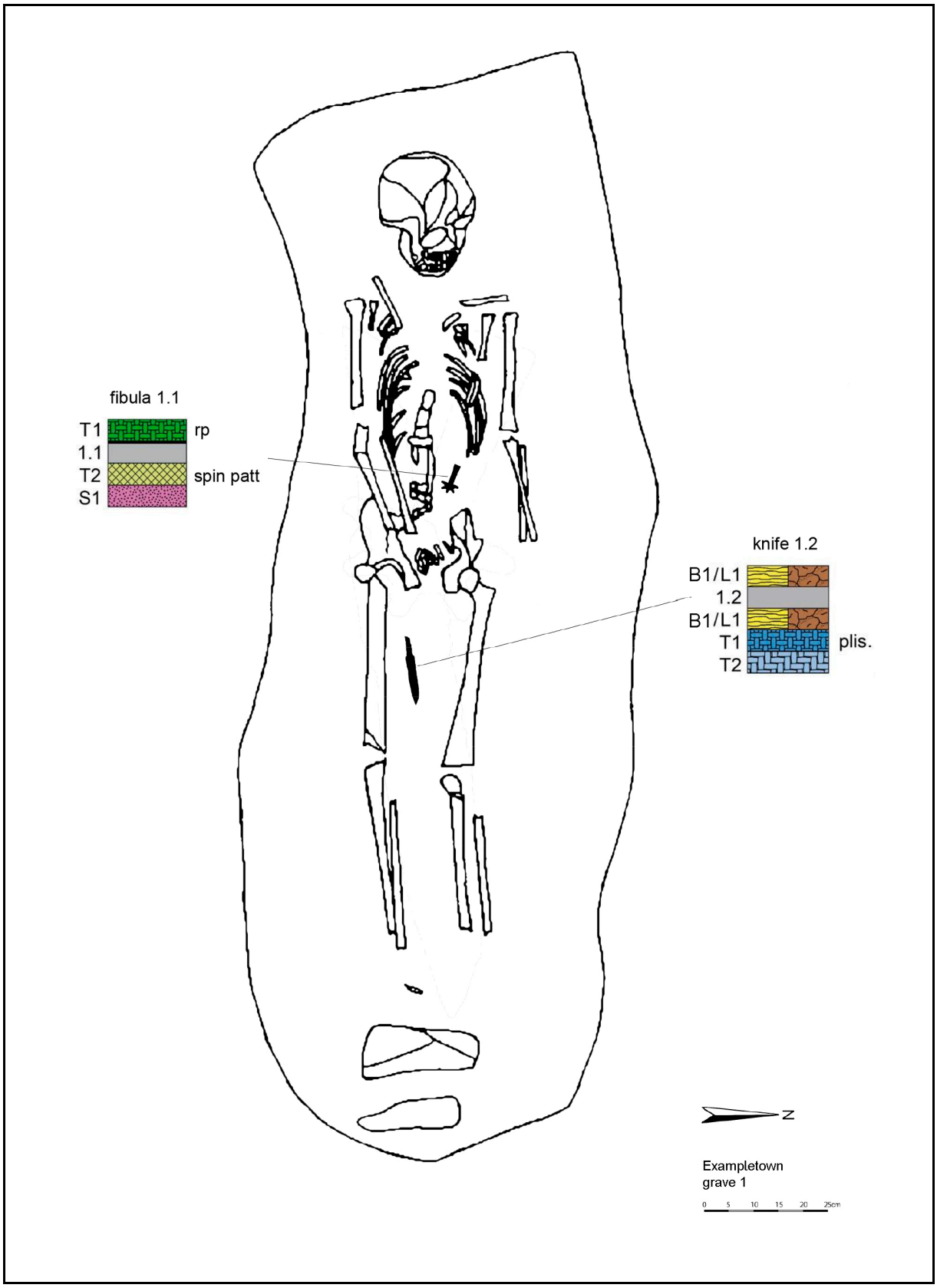
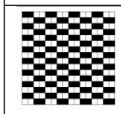
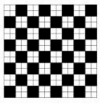
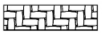
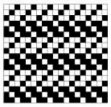
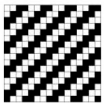
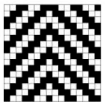
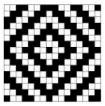
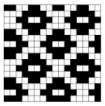
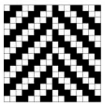
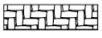
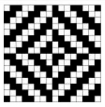
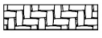
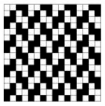
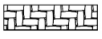
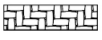
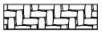
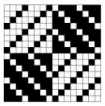
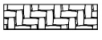


Fig. 8: Grave plan with placement of the organic remains.

5. Appendix

5.1 Textile Structures with Typical Early Medieval Variants and Short Identifiers for the Mapping System

	weave type [1]	**short identifier for mapping system**
	**tabby T 1/1 (plain weave)**	
	repp	 T (rp)
	basket weave	 T (bk)
	**twill 2/1** (Z- or S-twill)	 Tw 2/1
	twill 2/1 chevron twill	 Tw 2/1 (ch)
	twill 2/1 diamond twill	 Tw 2/1 (dia)
	twill 2/1 „Rippenköper“	 Tw 2/1 (rip)
	**twill 2/2** (Z- or S-twill)	 Tw 2/2

	weave type	**short identifier for mapping system**
	twill 2/2 chevron twill	 Tw 2/2 (ch)
	twill 2/2 diamond twill	 Tw 2/2 (dia)
	twill 2/2 bird´s eye twill	 Tw 2/2 (be)
	twill 2/2 broken chevron/ herringbone twill	 Tw 2/2 (hb)
	twill 2/2 broken diamond twill	 Tw 2/2 (bdia)
	twill 2/2 „Kreuzköper“ broken twill	 Tw 2/2 (bt)
	**twill 3/1** (Z- or S-twill)	 **Tw 3/1**
	**twill 3/1** chevron twill	 Tw 3/1 (ch)
	**twill 3/1** block damask	 Tw 3/1 (bdk)

5.2 Chart with Colour Values (Colour Mode Adobe RGB/CMYK)

material	colour values PS	R	G	B	C	M	Y	K
object 115%	818184	129	129	132	54	45	39	5
object 100%	a5a7aa	165	167	170	41	31	27	0
object 60%	c3c4c6	195	196	198	27	20	18	0
wool/fine animal fibre 120%	4a7293	74	114	147	82	48	25	3
wool/fine animal fibre 100%	5798d3	87	152	211	76	24	0	0
wool/fine animal fibre 60%	95b8e2	149	184	226	51	17	0	0
vegetable fibre 120%	578246	87	130	70	79	25	89	8
vegetable fibre 100%	70b154	112	177	84	73	0	85	0
vegetable fibre 60%	a5ca8e	165	202	142	48	0	55	0
leather 115%	7e553d	126	85	61	36	65	75	27
leather 100%	9f6a49	159	106	73	28	62	73	11
leather 60%	c29b7f	194	155	127	21	44	49	0
fur/pelt 115%	717297	113	114	151	63	56	19	1
fur/pelt 100%	888ec3	136	142	195	53	43	0	0
fur/pelt 60%	b0b4d9	176	180	217	35	28	0	0
bone/antler/horn 111%	c3bc51	195	188	81	29	17	82	0
bone/antler/horn 100%	f2eb57	242	235	87	10	0	78	0
bone/antler/horn 60%	f6f29c	246	242	156	7	0	50	0
wood 120%	59866a	89	134	106	78	27	64	6
wood 100%	73b98e	115	185	142	70	0	55	0
wood 60%	a8d0b5	149	210	181	46	0	36	0
feather 115%	aa6e31	170	110	49	23	61	92	7
feather 100%	de8a31	222	138	49	0	55	90	0
feather 60%	eab479	234	180	121	0	37	56	0
special material I 120%	93333a	147	51	58	24	91	73	15
special material I 100%	ce3644	206	54	68	0	89	66	0
special material I 60%	dd8a7c	221	138	124	0	58	44	0
special material II 115%	7e6c22	126	108	34	45	48	100	22
special material II 100%	a28a21	162	138	33	36	40	100	7
special material II 60%	c5b26c	197	178	108	24	27	66	0
special material III 115%	8c6289	140	98	137	46	69	20	1
special material III 100%	ae78af	174	120	175	27	62	0	0
special material III 60%	c8a7cc	200	167	204	17	41	0	0
substance 115%	9ca36c	156	163	108	47	25	66	2
substance 100%	cad685	202	214	133	30	1	60	0
substance 60%	dce3b0	220	227	176	20	1	40	0
fabric type 1	4571b6	69	113	182	86	53	0	0
fabric type 2	cd3233	205	50	51	0	96	89	0
fabric type 3	5ab4ae	90	180	174	80	0	38	0
fabric type 4	99bbe9	153	187	233	43	15	0	0
fabric type 5	ce5098	206	80	152	1	84	0	0
fabric type 6	f1ea36	241	234	54	7	0	100	0

5.3 Bibliography of Works Using the Mapping System

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