

NATURE AND LANDSCAPE MANAGEMENT STANDARDS

VISITOR INFRASTRUCTURE

**MARKING OF PROTECTED AREA
BORDERS AND MONUMENT TREES**

SPPK F
02 005: 2023

SERIES F

Hraniční značení chráněných území a památných stromů

Grenzmarkierung von Schutzgebieten und Gedenkbäumen

This standard describes measures for marking of protected area borders and monument trees.

Related bibliography:

Act no. 114/1992 Coll. on Nature and Landscape Protection, as amended

Decree no. 45/2018 Coll., as amended, on management plans, management principles and documents for declaration, record-keeping and marking of protected areas

Standard development:

Developed by NCA CR in 2020-2022

Expert review:

Ministry of the Environment, Special Territorial Nature and Landscape Protection Department, Ing. Petr Stloukal and Ing. Jan Chládek, 28 December 2022

Authorial collective:

Mgr. Ondřej Vitek, Ph.D.

Drawings:

Mgr. Ondřej Vitek, Ph.D.

Alena Hlaváčová

Standard approved on

RNDr. František Pelc
Director of NCA CR

Table of contents

1	STANDARD PURPOSE AND CONTENTS	3
1.1	Standard purpose	3
1.2	Legal framework	3
2	DESIGNS APPLIED IN PRACTICE.....	4
2.1	Marking types.....	4
2.2	Colours in national coats of arms	4
2.3	Providing the name of NR, NM and MT.....	4
2.4	Material specifications.....	4
2.5	Gaps between signs	4
2.6	Marking of nature parks	5
3	TECHNICAL DESIGN FOR BORDER MARKERS	5
3.1	Marking position in relation to the border.....	5
3.2	Orientation.....	5
3.3	Mount design.....	6
3.4	Border marking on other devices	6
4	STRIP MARKING	7
4.1	Marking position in relation to the border.....	7
4.2	Distance between marking	7
4.3	Objects suitable as strip marking carriers and execution method, including surface preparation.....	7
5	RECORDS, INSPECTION AND MAINTENANCE.....	9
6	LIST OF ABBREVIATIONS:.....	10
	ANNEXES	11

1 Standard purpose and contents

1.1 Standard purpose

- 1.1.1 The standard describes performance of various methods of marking of borders of various categories of protected areas and monument trees. The described methods are based on legislation in force and reflect many years of experience with practical marking work.

1.2 Legal framework

- 1.2.1 Marking borders of specially protected areas (SpPA) is grounded in Section 42, Para. 4 of Act no. 114/1992 Coll. on Nature and Landscape Protection, as amended (NLPA). Marking of monument trees (MT) is defined similarly in Section 47, Para. 2. Provisions of Section 42, Para. 5 refer to details on NLPA marking defined by Decree no. 45/2018 Coll. as amended (the Decree). Similar reference for contractually protected areas and monument trees is specified in Section 39, Para. 1 of the NLPA, for Sites of Community Importance (SCI) in Section 45c, Para. 1, for Special Protection Areas (SPA) in Section 45e, Para. 7, and for monument trees in Section 47, Para. 3. The NLPA reference to marking of borders of quiet areas of national parks is contained in Section 17, Para. 4; the marking definition contains information on conditions for movement on paths and trails in quiet areas of national parks. The Decree defines marking of borders in the field in Sections 16 and 17 and in Annex 6.
- 1.2.2 The large national coat of arms is used for identification of national parks (NP), protected landscape areas (PLA), national nature reserves (NNR) and national nature monuments (NNM). The small national coat of arms belongs to nature reserves (NR), nature monuments (NM) and monument trees (MT). Contractual protection areas, SCI and SPA shall not have a national coat of arms, but if their border coincides with another category that shall have a coat of arms, the coat of arms shall be used for marking all of the present categories. An example is the coincidence of borders of a PLA and an SPA (marked progressively from the top with a sign with a large national coat of arms, a sign with the PLA category and name, and a sign with the SPA category and name), or borders of NR and SCI (marked progressively from the top with a sign with a small national coat of arms, a sign with the NR category and name as applicable, and a sign with the SPA category without a name).
- 1.2.3 Strip marking is used for NNR, NNM, NR, NM and NP quiet areas. Its appearance is defined by the Decree, Section 17, Para. 3.
- 1.2.4 The NLPA and the Decree contain further details on the marking. They have to be respected, but the standard does not specify them all. The Ministry of the Environment (MoE) has published on its web site a graphic manual specifying certain details of marking and containing fonts and graphic templates for manufacturing of signs; for example, it precisely defines colour shades and fonts for the signs.

2 Designs applied in practice

2.1 Marking types

- 2.1.1 The NLPA prescribes signs as one of the marking types. They are most commonly fastened to mounts referred to as border markers (or “markers”, which is better suited for monument trees). The appearance of the marker is specified in Annex 1a, and Annex 1b specifies marker anchoring in the ground. One marker has all the respective signs mounted on it; there may be multiple sign in the event of multiple protection categories coinciding. Below the signs mounted under the Act, the marker may carry additional elements, such as information plates, pictograms, etc.
- 2.1.2 Another marking type under the Act is strip marking. It has the form of two horizontal red strips 5 cm wide, with a 5 cm gap between them. The top strip (as per Section 17, Para. 3 of the Decree) runs all around the perimeter of the object on which it is placed, while the bottom strip covers only the section of the perimeter of the object corresponding to the section of the non-protected area.

2.2 Colours in national coats of arms

- 2.2.1 The MoE graphic manual acknowledges the option to use gold and silver in the national coats of arms, or to replace them with yellow and white. The yellow and white combination is used commonly in practice, as it reduces production costs and obviously attractiveness of the signs to vandals, who like to steal signs with the national coat of arms.

2.3 Providing the name of NR, NM and MT

- 2.3.1 Pursuant to the Decree, the name of the protected area is always shown on the marking for the categories NP, PLA, NNR, NNM and SPA. In normal situations, the NCA CR also shows names on signs marking MT and borders of NR and NM. A sign containing only the category without the name is only permissible for NR, NM and MT and only in two cases:
- the border or object marking contains the name elsewhere on the same object, for example an information plate,
 - the category sign has been replaced after damage or theft with a sign from the stock of the respective office, which did not have a name sign available.

2.4 Material specifications

- 2.4.1 In normal situations, separate signs are used corresponding to templates in Annex 6 to the Decree, in the enamelled version on a metal base with holes 4 mm in diameter. With respect to shape stability, the convex shape is recommended for all signs. In justified cases, where the respective office has so decided, a different base material is possible, including all the necessary signs (typically the coat of arms and the category and name signs) being made together on a single piece of base material. If marking signs at a specific location are a target for vandals (significant sign damage or theft) repeatedly and its factual service life is thus not longer than 1 year, laminated paper signs or a similar cheap and operative solution can be used.

2.5 Gaps between signs

- 2.5.1 The Decree (Annex 6, point 6) specifies the sequence in which individual signs are placed from top to bottom. At the same time, it specifies that the gap between the signs must not be wider than 10 mm. Gaps 10 mm wide are always used in practice. This figure is the basis for calculation of the border marker sign height in Annex 1a. If all the necessary signs (typically the coat of arms and category and name signs) are produced together on a single piece of base

material, the 10 mm gap has to be retained between the edges of the rectangles representing the individual signs according to the Decree.

2.6 Marking of nature parks

- 2.6.1 The NLPA does not impose any obligation to mark borders of nature parks or other categories of areas in the field. Nevertheless, it does not prohibit such marking either. Thus, if the applicable nature protection authority decides that there is a need to mark borders of a nature park in the field, it may use markers of similar form as for NR, NM, and MT. It is advisable to leave out the coat of arms completely (use of the large national coat of arms might even be construed as violation of Act no. 352/2001 Coll.).

3 Technical design for border markers

3.1 Marking position in relation to the border

- 3.1.1 The Decree stipulates that border markers (or signs identifying the border) are placed on access paths and in other suitable places. The character of the path is not important. Everyone entering a protected area in the normal way has to be informed by means of marking that they are entering a protected area and about its category. Thus, a border marker is always required where a road, track or any other marked path approaches or crosses the area border. A border marker is additionally placed on unmarked tracks and footpaths if the applicable office decides so after considering local conditions.
- 3.1.2 When choosing the exact location of the border marker, there is no need for excessive accuracy because the marking is intended primarily for visitors, and partly for property owners. The important aspect is that the marking must not limit use of affected property. Most frequent collisions in practice occur with protective zones of public roads. They have to be respected, as well as the need for interventions in vegetation along road edges. The border marker shall be placed as far from the road edge as to where routine interventions for traffic safety can be done. For example, they shall be put beyond the mown herbaceous strip, even though the legislative border follows the road edge.
- 3.1.3 Where a border marker cannot be placed exactly on the border, it is advisable in most cases to move it inwards into the protected area. Exceptions are cases where the protected area comprises a water body or watercourse. In such a case, the border marker shall be placed along the bank vegetation, unless it is endangered by expected bank erosion. If only shallow erosion is expected, the border marker can be placed there, but the anchoring depth has to be increased by the depth to which the erosion may affect the surface.
- 3.1.4 For monument tree markers, the main rule is that the mounting post must not damage or negatively affect the growth of the monument tree. Thus, the anchoring of a newly installed marker has to be made outside the reach of the tree's roots, typically outside the reach of its branches in the plane view projection. If impossible for any reason, the position shall be determined by the dendrologist from the applicable office managing the tree.

3.2 Orientation

- 3.2.1 Border markers are typically oriented so that the plane of the signs on the border marker is flush with the border line and, at the same time, the front of the signs faces outside the area (see Annex 1). Thus, the person approaching the area border perpendicularly sees the signs facing the ideal angle, while the person walking along the border sees the side of the border marker. A border marker located at a corner point shall be turned obliquely so that its rear faces the axis of the angle of the border at that point.

- 3.2.2 The standard orientation of a monument tree marker is with its rear towards the trunk, so that the marker faces the visitor approaching in the most common access direction (see Annex 2). If the monument tree grows beside a path, the marker shall be placed in front of the tree at the shortest imaginary line connecting the tree trunk and the edge of the path. However, if the above location disrupts the view too much, the marker may be shifted along a circular sector with its axis being the line connecting the centre of the trunk with the ideal marker position and its sides forming a 45° angle with the axis. Nevertheless, the marker shall still face the path, or the visitor.
- 3.2.3 Monument trees protected as a group in the form of a linear avenue are marked with two markers. One is placed ahead of one end of the avenue so that the avenue is behind its rear, and the other one identically at the other end of the avenue. If an avenue comprises two lines of trees, the marker is always placed so that its rear faces the right-hand tree line as viewed by the observer.
- 3.2.4 If a group of trees other than an avenue is protected as monument trees, the location and orientation of markers shall be identical to marking of protected areas. If, however, such protected monument trees include other woody plants not falling under the protection but not designated for felling, then each tree belonging to the monument tree group has to be marked with a separate marker.

3.3 Mount design

- 3.3.1 The appearance of a border marker is specified in Annex 3. The post is made of solid wood, the board and roof usually of waterproof plywood (glue class 3 – AW 100 as per ČSN EN 314-2). Annex 4 suggests suitable border marker anchoring. Deviations according to instructions of the applicable office are possible in justified cases.

3.4 Border marking on other devices

- 3.4.1 Signs for marking protected area borders or monument trees can be mounted on other carriers than border markers. They include information panels, walls, rocks and other objects. The important rule is that the placement of signs (or other items necessary for fastening them) and their expected maintenance method must not lead to any damage to nature, particularly objects of protection, or to interests protected under other acts of law.

4 Strip marking

4.1 Marking position in relation to the border

- 4.1.1 Rules specified above for marking with border markers apply analogously for placement of strip marking. The existence of a suitable object that could carry the marking is more important for strip marking than exact position. With a view to the size of the area marked and the character of its border, marking is permissible at a distance of up to 10 m from the actual border if no other suitable object is closer to it. This applies in particular to marking made on trees. If the marking is made on posts that perform no other function, the position deviation must not exceed 2 m. A larger deviation in the location of posts is only permissible where a correctly placed post would preclude legitimate interest, e.g., roadside vegetation maintenance. The smaller the area, the greater the requirement for exact border marking.
- 4.1.2 Where marking cannot be placed exactly on the border, it is advisable in most cases to move it inwards into the protected area. Exceptions are cases where the protected area comprises a water body or watercourse. In such a case, the strip marking shall be placed along the bank vegetation line, be it on trees or posts.
- 4.1.3 For very small areas, where the entire border is easily visible from the border marker (up to hundreds of square metres), or where all the border markers are within sight of each other, strip marking can be omitted completely. Strip marking is not placed on border markers or any other structures (including chapels, wayside crosses, etc.). Exceptions include the need to mark the border line on a border marker post where the border makes a sharp bend. According to the Decree, strip marking is also omitted where the specially protected area comprises only a building or a part of it, or an underground mine.

4.2 Distance between marking

- 4.2.1 The Decree specifies that strip marking should be placed notably at corner points of protected area borders important for orientation. These are the basic locations for strip marking, and additional marking between corner points is laid out from there.
- 4.2.2 Moreover, the Decree specifies that strip border marking is placed in the field so that the distance between the marks does not exceed the distance from which one mark is clearly visible in daylight from the next one. Commonly, this distance is considered to be no more than 60 m. That said, the marking must consider factors such as shrub overgrowing, service life of marking itself and the object carrying it, frequency of inspections and others that may affect marking visibility. Depending on these parameters, the distance between strip marking can be reduced in the respective section.

4.3 Objects suitable as strip marking carriers and execution method, including surface preparation

- 4.3.1 If an object chosen for strip marking is not owned by the organization that is also the applicable nature protection authority, the marking can only be placed on it in case its owner consents to it. However, the owner's consent only applies to the marking execution; the owner has to tolerate the marking itself since it is the obligation of the authority that declared the protection. Thus, for instance, the owner may require that the strip marking is not placed on his/her tree, but then has to tolerate the installation of a post.
- 4.3.2 Although the Decree deals mainly with posts, trees are without a doubt the most frequent carrier of strip marking in practice. Significant and aesthetically valuable trees, as well as all other trees with a trunk diameter above 80 cm, are unsuitable as carriers of strip marking. Particularly suitable are healthy and promising trees with smooth bark, a straight vertical trunk with a diameter greater than 20 cm, free of moss, lichen, algae and climbing plants. Such trees require

no special preparation for marking other than cleaning the trunk (typically using scrubbing or wire brush) for the paint to adhere well and last. If the tree bark surface is not cohesive, the surface layer is also removed using, for example, a wire brush. If the bark is cracked, it shall be gently levelled using, for example, a scraper or shave. However, this must not interfere with the phloem. In oaks and pines, for example, it lies just underneath the bark, at the “bottom” of deeper bark cracks. On oaks with a coarse bark, thus, only remove the upper inconsistent layers of the bark, but do not level the surface. Strip marking on trees is typically made at a height of 130-150 cm above surrounding ground. On trees, it is important to consistently observe the Decree requirement that the bottom marking strip covers exactly that part of the trunk circumference that corresponds to the unprotected section of the area. The area border then has to be understood to pass exactly through the centre of the tree trunk carrying the marking. The edges of the marked section point towards the nearest strip marking on either side.

- 4.3.3 Similarly to trees, various poles and columns can be used, if possible with a diameter of at least 20 cm. Poles with a circular cross-section are advantageous; square or other poles (columns) can be used in extreme cases. The pole material is unimportant. Truss pylons are unsuitable for placement of strip marking.
- 4.3.4 If the border runs through an area with perpendicular or sheer cliffs made of compact hard rock, which are not an object of protection or an outstanding geological formation, strip marking can be placed on the cliff face. As a rule, marking is not placed on sandstone, travertine, surfaces with evident fossils or rocks overgrown with natural vegetation at the point of interest. Marking on rocks is placed in morphologically suitable places, typically 130-150 cm above the rock base. The surface is cleaned with a wire brush before applying the paint. Since the marking on rocks is typically flat, it is rendered as two horizontal strips, the top one being 40 cm long and the bottom one 20 cm painted along the same vertical axis (see Annex 5).
- 4.3.5 In meadow enclaves in particular, there is often no other way to make strip marking than using separate posts. The most suitable material for such posts is (durable) hardwood. Black locust and oak wood, for example, is good to use. Recycled plastic is a good alternative. Posts with a circular cross-section are ideal, but squared timber can also be used; other shapes less so. The posts shall extend at least 1 m above soil surface. When placed in higher vegetation, the top of the posts shall exceed the vegetation by at least 30 cm (at the maximum vegetation growth stage). Strip marking is placed on posts near their top, so that the post base colour above the top red strip is 5 cm high.

5 Records, inspection and maintenance

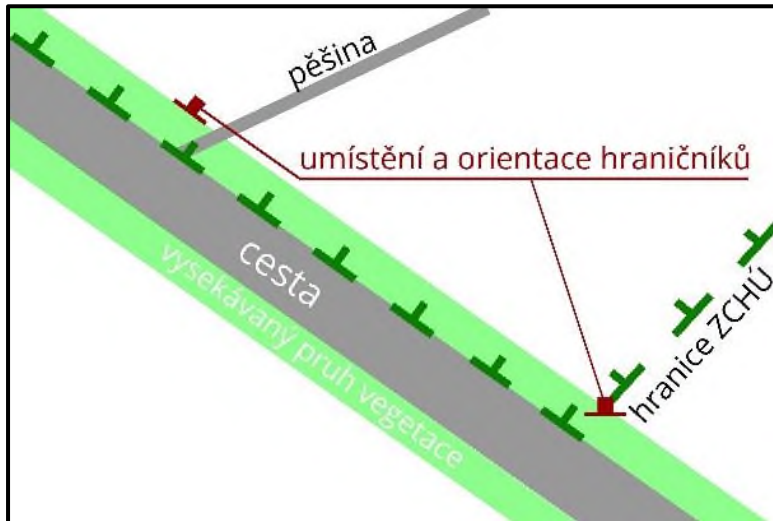
- 5.1.1 Border markers are registered as assets and visitor infrastructure items. Strip marking is not registered as such, but if it is placed on a separate carrying object, the object is registered. Given possible damage and replacement of individual marking objects, each object has to be registered separately. Asset records focus primarily on dates of making, renovation and removal, and data on costs. Visitor infrastructure records contain, in particular, description of the technical design, location (including map depiction) and dates and results of inspections, maintenance and repairs. It is advisable to join both record types in the same system.
- 5.1.2 Marking inspection is made at least once a year; twice in areas with two-season visitation (high counts in both winter and summer). Inspection is both visual and by strength tests of individual components, joints and ground anchoring. The purpose of the inspection is to obtain data for planning marking repairs or renovation where needed. Marking has to be put in fully functional condition before the beginning of the visitor season. Extraordinary inspections are advisable if it can be assumed that the marking may have been damaged for any reason (e.g., after a windstorm that caused damage to forests). The inspection party should carry equipment for making minor repairs, e.g., tools (screwdrivers, wrenches, pliers, etc.), fasteners, signs of the necessary types, a wire brush, paint brush, paints, cloth, alcohol and thinner, etc., so that trivial defects can be resolved on the spot.

6 List of abbreviations:

NCA CR	Nature Conservation Agency of the Czech Republic
SCI	Site of Community Importance
PLA	Protected Landscape Area
MoE	Ministry of the Environment of the Czech Republic
NP	National Park
NNM	National Nature Monument
NNR	National Nature Reserve
SPA	Special Protection Area
NM	Nature Monument
NR	Nature Reserve
MT	Monument tree
SPPK	Nature and Landscape Management Standards
SpPA	Specially protected areas
NLPA	Act no. 114/1992 Coll., as amended

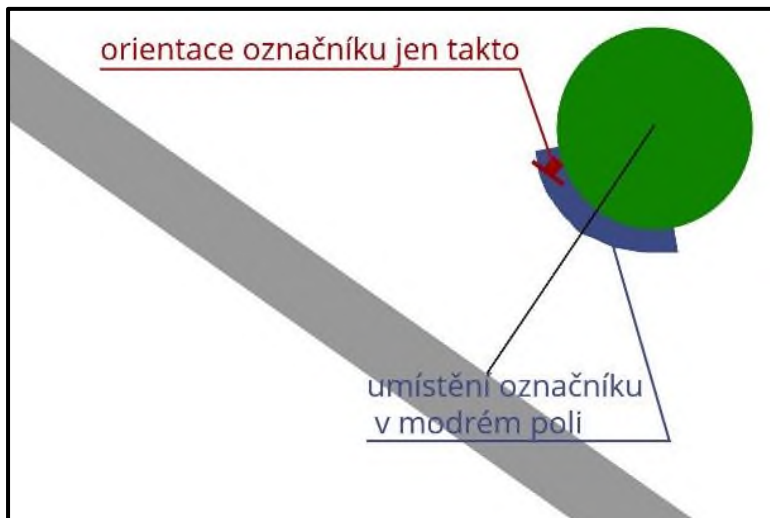
Annexes

Annex 1: Border marker orientation sketch



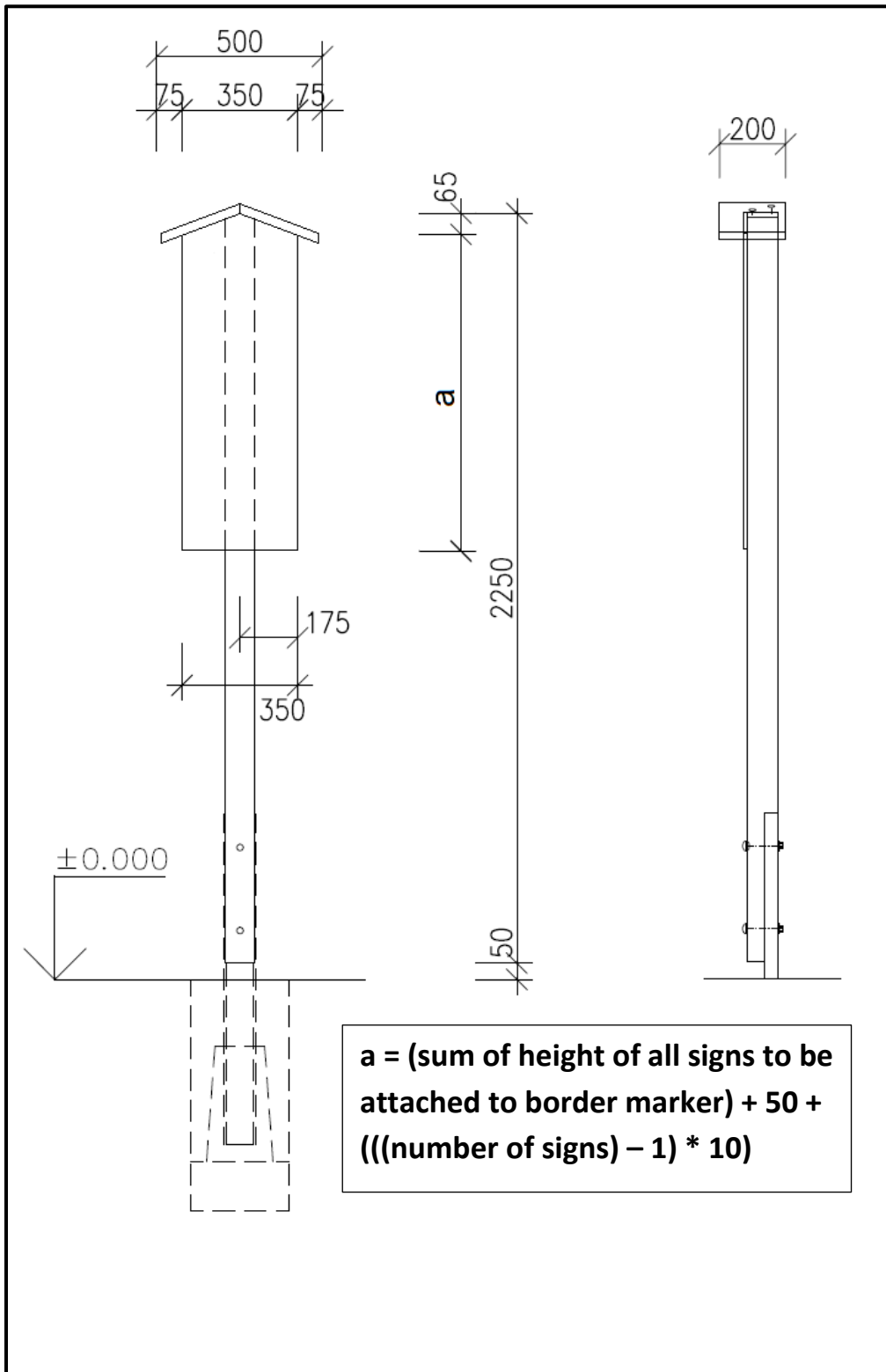
pěšina	footpath
umístění a orientace hraničnicků	border marker placement and orientation
cesta	road
hranice ZCHÚ	SpPA border
vysekávaný pruh vegetace	mown vegetation strip

Annex 2: Monument tree marker placement and orientation sketch

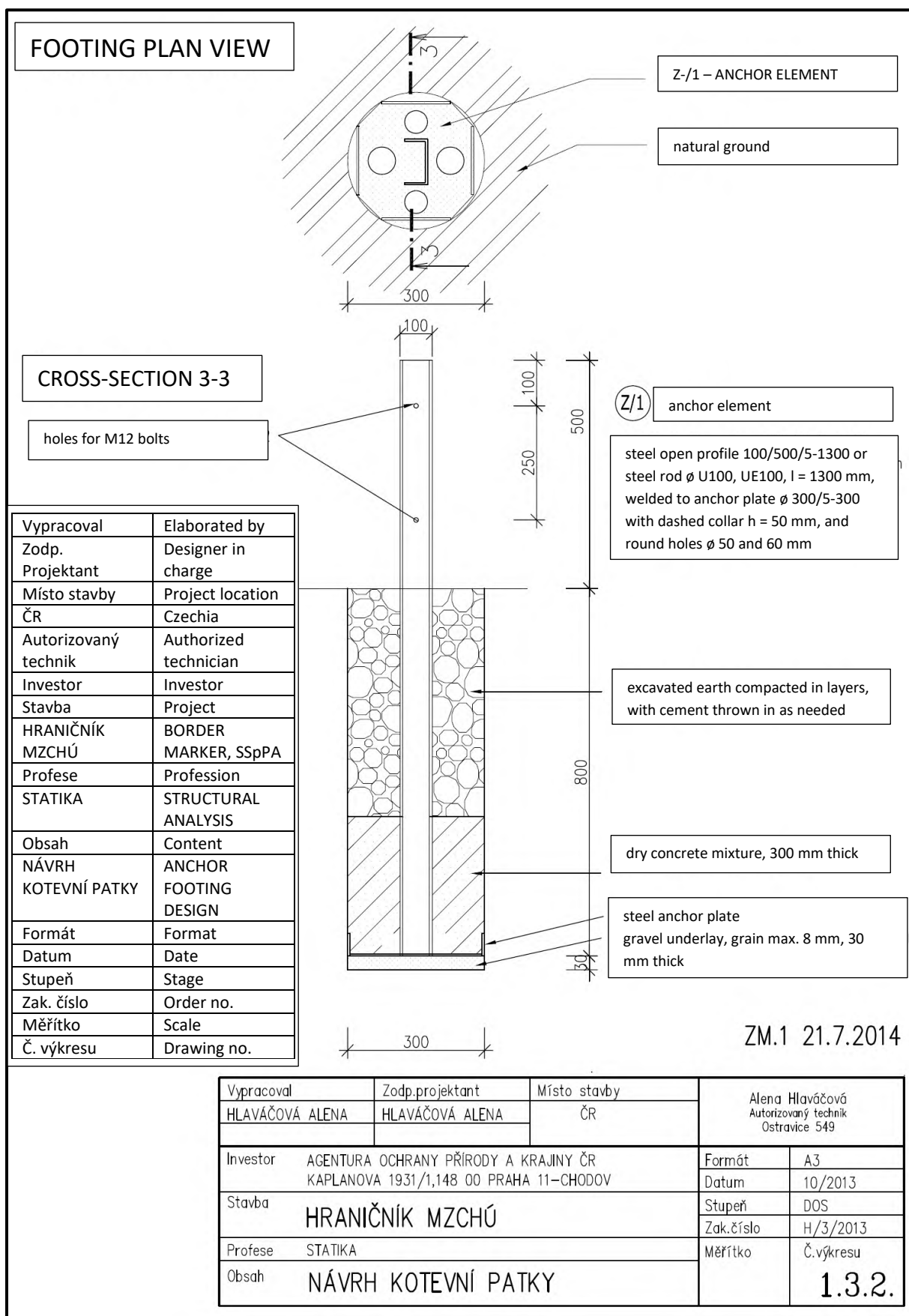


orientace označníku jen takto	use only this marker orientation
umístění označníku v modrém poli	marker placed within blue field

Annex 3: Border marker design sketch



Annex 4: Border marker anchoring



Annex 5: Template for flat strip marking on rock faces (dimensions shown in millimetres)



© 2023 Nature Conservation Agency of the Czech Republic
Kaplanova 1931/1
148 00 Praha 11

SPPK Marking of protected area borders and monument
trees

aopk.gov.cz/platne-standardy

2023