

Map Council of the Czech Orienteering Federation reacts on the ISSOM Draft 2004

The following text is partly derived from the document **ISSOM standpoint - Map Council CSOB**, which was published by the Czech Map Council 2003-06-26 and reacted on the first ISSOM2003 Draft. This text can be still found at <http://maps.orientacnibeh.cz>. If some statements are repeated, it means we consider it of high importance or a problem is in our opinion still not solved properly.

The very final International Specification for Sprint Maps supposed to be published in the year 2005. In the meantime mapmakers can use the Drafts. However many mappers use their own keys usually more similar to the ISOM2000. Why is this happening? In our opinion there are still some leaks in the Draft 2004 and only careful listening to other opinions can reverse this trend. Only if the ISSOM will be positively accepted both by orienteers and mappers, only then can the specification contribute to generally accepted interpretation in all IOF member states and to further development of the sprint orienteering.

In the following text Czech Map Council presents principles, which should sprint maps fulfill, confronts these principles with the ISSOM concept, shows particular examples of inner ISSOM discrepancy and remarks upon graphic interpretation of individual symbols with possible solutions. Czech Map Council believes that this contribution will help to the further development of the sprint orienteering.

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Sprint map principles

1. Map legibility

Orienteer runs in a very high speed during a sprint competition. Orienteer should obtain as much information from a map as possible. A map should allow it, make map reading easy, not the other way round.

2. Barriers versus communications

Barriers make running difficult in contrast to communications. Graphic expression of symbols should respect it. Symbols for barriers and communications should be most different.

3. Passable versus impassable barriers

Distinct differentiation between passable and impassable barriers is an important precondition for right route choice and fair conditions.

4. Communications with traffic versus without traffic

Traffic is kind of danger for an orienteer. That's why areas with traffic should be emphasized in a map. Intensity of danger should be shown, at least in two degrees.

5. Navigation value of feature versus its dimensions

Selection of features for a map should be influenced primarily by their navigation values, secondary by their dimensions. Specification for orienteering maps should only guide and recommend by this selection.

6. Map scale and contour interval

Map scale should compromise between map legibility and map format. Contour interval should correspond with prevalent terrain gradient and compromise between understandable expression of terrain and drawing density. Map should be mapped in bigger or same scale as published.

7. Vertical level

Map represents features in basic vertical level and underpasses, overpasses and passages, which primary connect basic vertical level. Vertically multilevel features are represented by its ground plan in basic vertical level.

8. Distinctive representation of passages and inaccessible areas

Passages which are usually unopen should be represented in a map as closed. Their passability during a competition is represented with overprinting symbols.

Sprint map principles in comparison with ISSOM2004 draft

ad 1. Map legibility

Maps in scale 1: 10 000 according to ISOM2000 must have symbols enlarged at 150 % (in comparison with maps in scale 1: 15 000). ISSOM does not follow this rule. Why? After all the symbol dimensions of the maps in scale 1: 10 000 work perfectly for detailed terrains. Why are some symbols in the ISSOM 1,2 times bigger (112.0 Knoll), some 1,6 times bigger (203.0 Passable cliff), some exactly 1,5 times bigger (206.0 Boulder) than in the scale 1: 15 000. Isn't it easier and more rational to keep the symbol dimensions in the same proportions? There are several varieties of the sport of orienteering. And it seems each of them have a different key. It is important when all sorts of orienteering maps have the same base. It is then easier for the newcomers and beginners to understand a map.

And also cartographers would surely welcome if the conversion from one scale to another is easy. There are many maps on the rims of cities originally meant for classic orienteering. If a cartographer would like to make a cut off of this map in the scale of 1: 5000 for sprint orienteering he would face a problem. He can not simply change the scale and enlarge symbols 1,5 times. He has to totally change the whole symbol set.

ad 2. Barriers versus communications

Barriers make running difficult in contrast to communications. Graphic expression of symbols should respect it. Symbols for barriers and communications should be most different. ISOM2000 does not solve this fact. Black line on such a map can mean stop as well as move forward. This discrepancy can cause problems especially in sprint competitions that are rich both in barriers and communications. False interpretation can mean much bigger delay than in classical forest terrains, where barriers are isolated. Communications represent a fundamental piece of information. They should be very distinctive and unchangeable with other symbols.

ISSOM2004 tries to solve this problem and introduces different screens of brown for different types of terrains. However it doesn't say in which terrains which screens of brown to use.

The symbol Unpaved footpath and track (506.1) is unfortunately defined only with one width. In the reality there are many widths of unpaved tracks and there are also unpaved areas. Even when the ISSOM2004 allows to use 10% darker screen for the non-urban footpaths and wider rim line, we think the symbol is still too indistinct. In areas with many contours, thickets and details around; it is very difficult to read.

The easiest way how to make communications very legible in contrast to barriers would be to use consistently different colors for both. In ISSOM2004 most of the communications are depicted in brown screens. However some footpaths (507, 508, 509) still remain in black color. That causes big troubles in map reading if combined with black barriers. Screens of brown can not be used for very narrow lines because of their low legibility. However there are other colors that could solve this discrepancy. For example if communications are defined in shades of red (the particular color can be different according to testing) it would totally solve this problem. It is obvious that this solution goes beyond the scope of present orienteering cartography traditions and need some courage to put it through. Also testing needs to be made to ensure the legibility for example for color blind people. We think the advantages would be enormous. See Annex 1,2.

ISSOM2004 implements a rule - impassable barriers are forbidden to overcome. We think that prohibition should be made by organizer of respective competition, not by cartographer. Forbidden areas should be represented by overprinting symbols as well as by markings in terrain. From this point of view symbol 421 Impassable vegetation seems needless.

ad 3. Passable versus impassable barriers

Overcoming of passable barriers should not mean a delay. Passable and impassable barriers should distinctively differ – e.g. by line width or color shade. ISSOM2004 combines both methods - different width and shade solve passability of walls (519.1, 521.1), passability of other barriers is solved only by different width. We think that all barriers should follow only one principle. The almost same gray color for canopies and passable walls is not acceptable.

Difference in line width between passable wall and impassable should be bigger. The same applies for passable/impassable cliff.

Passable barriers should not endanger safety of an orienteer. Impassable barriers can be impassable, dangerous or forbidden to cross.

ad 4. Communications with traffic versus without traffic

Traffic is kind of danger for an orienteer. That's why areas with traffic should be emphasized in a map. A map should show traffic intensity at least in two levels (shades).

ISSOM2004 avoids this problem by forbidding competitions in areas with unexpellable traffic. However traffic will not be expelled during most of the sprint competitions. It is simply not manageable for small event holders. Far more practicable solution is to percept traffic as a fact and correspondingly represent it on a map.

Traffic intensity and type of ground can be represented by different screens. There are several ways how to solve it. Some are described in the following paragraphs.

You can either use **the lighter** screen of brown for **the easier** running. (This way of thinking is similar to the way of depicting vegetation – forest in white color means fast running and the darker screen of green the slower running.) You get light brown for pedestrian areas and dark brown for traffic areas. However paved footpaths are narrow. And narrow light brown pavement in forest would be very indistinct as it is in the ISSOM2004.

The other way is to use **the darker** screen of brown for **the easier** running. (This way of thinking is similar to the way of depicting open areas – Open land depicted with 100% solid yellow means fast running, lighter screen of yellow for Rough open land means slower running.) If you apply this way of thinking you get light brown for traffic areas and dark brown for pedestrian areas. Of course to be consistent small footpaths (in ISSOM2004 depicted as a dashed black line) would be then solid brown. This discrepancy has been described already above (ad.1).

New color for communications would elegantly solve it. For example light red for traffic areas and darker red for pedestrian areas. Edge of pavements would remain in thin black line (0,07mm). Small footpaths would be then in solid red. See Annex 1,2.

ad 5. Navigation value of features versus its dimensions

Selection of features for a map should be influenced primarily by its navigation value, secondarily by its dimensions. ISSOM2004 should widen the range of prevailing symbols. Urban terrains are often so specific, that it is nearly impossible to assign symbols firmly to all possible features. It is cartographers task to creatively depict situation with basic symbols in a legible way.

ad 6. Map scale and contour interval

Map scale should compromise between map legibility and map format. The most suitable scales for sprint maps as experience shows are 1: 4 000 and 1: 5 000. Contour interval should correspond with prevalent terrain gradient and compromise between understandable expression of terrain and drawing density. In flat terrains could be that 1 meter, in steeper terrains 2 or 2.5 meters. In flat urban terrains, where elevation information is not decisive in competition, could be contours omitted.

ad 7. Vertical level

Map represents features in basic vertical level and underpasses, overpasses and passages, which primary connect basic vertical level. Vertically multilevel features are represented by its ground plan in basic vertical level. This principle corresponds with ISSOM2004.

ad 8. Distinctive representation of passages and inaccessible areas

ISSOM2004 forbids overcoming of many barriers. Map specification should not contain a principle which is not to be checked by map committee. That is an organizer matter and competency. Organizer should represent areas with forbidden access by overprinting symbols and mark it in a terrain. Causes of no entry areas do not have to necessarily correspond with cartographer's point of view.

This rule should be rather implemented into rules for the sprint orienteering. Rules for the sprint orienteering could contain a principle that barriers that are depicted as impassable are forbidden to pass.

It is not explained in the ISSOM2004 why are some texts in purple and some in black.

Particular comments to ISSOM proposal (according to its chapters)

The chronological order of chapters 1, 2, 3, 4 should be rather 1, 4, 2, 3 – introduction, principles, content.

1 Introduction

Definition of urban and non urban areas is missing. ISSOM2004 frequently uses these expressions. Anyway we think that evaluation of the same features according to their urban or non urban location is wrong. Is Japanese rock garden surrounded by skyscrapers more urban then classical English park?

4 Principles:

- 4.3.1 – prohibition of underground control points is too strict, especially in underpasses below obstacles (railway, highway, river) are controls suitable, problems may be avoided by control description.
- it also does not allow to have the last control and finish area for example in exhibition arenas; that is very helpful for the promotion of sprint orienteering
- 4.2, 4.3, 4.4 – these chapters should be rather in the rules of the discipline of sprint orienteering

6 Symbol definitions

- no statement that point symbols should be placed in center of gravity
- presentation of symbols is not unified (some as straight line or rectangle, some as curve, some in combinations with other signatures) – should be unified, an extra column may be introduced for examples

6.1 Land forms

- 101, 102, 103 – should be pointed out that contours should be above all area symbols; it helps to read the 3D shape of a terrain (in case of paved areas, buildings it is not often so)
- 106, 108.1, 110, 112, 115, 116, 117, 118 – these symbols may not touch a contour line as it is specified by symbol number 113

6.2 Rock and boulders

- 201 – it should be permitted to use shorter tags; it is especially needed by one-sided walls/cliffs in urban areas

6.3 Water

- 305.1 – should be stated, that the border may be symbol 529.1 as well, or other line object

6.4. Vegetation

- 401, 415 – both symbols are described as "cultivated land", 415 could be rather "farming land"
- 411 – specification of shades is missing, or link to symbols which may be treated in this way (406, 408, 410)
- 414 – line width 0.07 mm is under the legibility limit given in Appendix 7.3 (0.10 mm for full line), the legibility limit should be decreased
- 418 – the criterion should not be the thickness of trunk, but the distinctness compared to surroundings
- 421 – superfluous symbol, very difficult to recognize for colorblind people; out of logical system, symbol 410 is sufficient; this symbol is not legible when applied on narrow stripes of vegetation – black dots are not visible

6.5 Man made features

- general principles may be as follow – thin full black line may be used for border of communications or manmade feature (pavement edge, step) wherever the corresponding line in terrain is absolutely clear and striking and passable (exceptions are contours of features impassable due to their substance, e.g. buildings, impassable water); thick full black line must be used wherever the corresponding line is impassable.
 - special point symbol for linear objects as big benches, signs is missing
- 506.1, 507 – it is misleading to show the same object differently in urban and non-urban areas and to use two different symbols; it is also usually difficult to state clearly borders of urban and non-urban terrains – we recommend to retain only 507, add the original 506 (ISSOM2000) and for all paved communications use symbols 529 and 529.1 with minimal dimensions like at 506.1
- it is often so that Unpaved footpath (506.1) and Small unpaved footpath (507) are on a map together, these features are in the reality very similar, the only difference is the width; it is often so that Small footpath becomes wider and changes into Unpaved footpath; this change is in a terrain very smooth but on a map depicted with symbols 506.1 and 507 it is very different; this change should be smooth also on a map
- 508 – in complex footpath systems with many intersections and short segments is this symbol with too big main gap unusable; definition similar to 507 accordingly downsized would be more appropriate
- 512.1 – no infill specified
- 515.2 – the symbol is indistinct, it disappears if tramway is not on communications
- 518.1 – similar parameters to distinct vegetation boundary, may be mistaken, short dashes might be better
- 526.1 – no explanation about black screen flexibility 50-65%
- 529 – no explanation about 3 screens of brown
- 529.1 – line width 0.07 mm is under the legibility limit given in Appendix 7.3 (0.10 mm for full line), the legibility limit should be decreased;
- The sentence: "Borders of pavements are generally not represented." should be explained. Pavements without black rim lines would be for example in forested areas, parks very indistinct.

6.6 Technical symbols

601 – blue color for magnetic north lines in sprint terrains is generally more suitable than black. In sprint terrains there are usually very few water features in contrast to black. In areas with many water features, black lines may be used.

6.7 Overprinting symbols

705 – marked routes can be sometimes marked in a terrain as wide corridors, that is not possible to depict with symbol 705