International Specification for Ski Orienteering Maps ISSkiOM

2009

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1 General

Maps for ski orienteering are based on the specifications for foot orienteering maps. However, in order to meet the specific requirements for the map because of the nature of the discipline, certain deviations and additions to the foot orienteering map specifications are needed. These special rules and symbols are described in this booklet.

Deviations from the specifications are onyl allowed with permission from the national Ski Orienteering Commission. For international events, permission must be given by the IOF Ski Orienteering Commission.

Complete foot orienteering maps may be used in ski orienteering competitions at all levels, if the dark green (symbol 410) is replaced by light green (symbol 406). For international events, permission from the IOF Ski Orienteering Commission is required.

2 Content

Ski orienteering is a sport in which the ski orienteer uses the map to navigate a track and route network in order to visit a number of control points. In ski orienteering, the competitor's skiing and navigation skills shall be tested in such way that the navigation skill becomes the decisive element.

Ski orienteering takes place on a track network, and involves as a basic element complex route choice problems, including estimating height differences. It is obvious that the map must concentrate on clearly depicting these features. The map must also be legible when skiing at high speed and in adverse weather conditions (snowfall, fog, rain, frost). This means that the map should omit a large part of details in “free“ terrain in order to highlight the visibility of the track network and to simplify the presentation of the shape of the ground. Only details that impact a) route choice and b) navigation and positioning, need to be shown on the map.

In order to accomplish fairness in route choice, additional symbols need to be introduced. These symbols describe the quality and width of the tracks.

3 Scale

The official map scales in official IOF ski orienteering events are:

1:15000 in long distance events
1:10000 in middle distance and relay events; and
1:5000 in sprint and sprint relay events;

In addition to the official map scales, two supporting map scales are available:

1:12500 in long distance events; and
1:7500 in middle distance and relay events.

These supporting scales can be used only by the permission of the IOF event adviser if one or more of the following conditions are met:

- When sprint, middle and long distance events are organized completely or partially in the same terrain, the very dense track system, used in sprint and middle distance, may make the same terrain severely illegible for the long distance competition in 1:15000 scale.

- When the ski orienteering events are organized at a cross-country and biathlon skiing stadiums or centers, (where the complex track system is packed in very narrow and tight areas with bridges, tunnels, walls, fences, earth walls, etc), it might not be possible to depict the complex track system legibly with the official map scales, and therefore, to maintain the legibility of the maps, supporting map scales are needed. This condition may apply even when major part of the terrain and track system is not dense, if some areas, located in the centre of the event, can not be depicted legibly and justly in the official map scales.

In ski orienteering, the map reading takes place at very high speed (especially in downhill sections) and often in weather conditions (frost and snow fall) that limit the readability of the map. That in combination with the above conditions, contain a risk that the competition will be won not on the merits of the sport, but on the legibility of the map. This is true, not only for the more experienced elite classes, but especially for the veteran and junior classes. Therefore, the IOF event adviser must, whilst keeping the strong preference on staying within the official map scales, decide on the use of map scales on the basis of legibility and fairness.

The magnification in scale has made it possible to build a more dense and easily legible track network. Furthermore, the error probability has decreased, as the shapes of the junctions and the departure angles of the tracks can be drawn correctly on the map.

4 Contour interval

Contour interval should be 5 m, but two other alternatives (2.5 m or 10 m) can be used, when justified.

5 Colours

The correct order of colours plays an important role in the legibility of a ski orienteering map. The order of colours of a ski orienteering map printed with a colour printer is to be as follows:

1. upper purple: control numbers and control codes, out-of-bounds areas, sanded or snowless roads and the start symbol as well as focus point when necessary
2. black
3. brown
4. upper green (PMS 354): tracks
5. lower purple: control points and lines between them
6. blue
7. lower green (PMS 361): all other green symbols except tracks
8. yellow

The order of the colours in a map printed by offset method is the same, so the printing order is opposite from the one mentioned in the list.

The contour lines are drawn over the tracks. This requires a colour printer of high quality so that the brown lines will not disturb the visibility of the tracks. Considering the amount of contour lines and tracks the organiser and the IOF Event Adviser may decide also to print track green over contour lines for better track readability.

6 Printing and reproduction

Ski orienteering maps are often updated very close to the competition. The track network may be revised only a few days before the event. Therefore, new digital printing methods (using digital colour press, laser printers, colour copiers with data connections etc.) are well suited for ski orienteering maps. It is possible to organise all IOF competitions on non-offset printed maps as well.

The responsibility for the quality of the map would belong to the organiser and the IOF Event Adviser.

7 Recommended symbols

7.1 Use of foot orienteering symbols

The following symbols from the foot orienteering map specification are recommended for the ski orienteering map.

Land forms
The shape of land is shown by means of contours. In order to maintain legibility of the map when skiing at high speed the contour lines may be more generalised in comparison to foot orienteering maps. Form lines shall not be omitted, if they are needed in flat terrain.
101 Contour, 102 Index contour, 103 Form line, 104 Slope line, 105 Contour value, 106 Earth bank, 107 Earth wall, 109 Erosion gully, 111 Knoll, 114 Depression.

Rock and boulders
Rocks and boulders are not likely to affect route choices, but in their prominent forms they can serve as valuable objects for navigation and positioning. The map may show these features when they are visible to the competitor when the terrain is covered with snow.
201 Impassable cliff, 202 Rock pillars/cliffs, 203 Passable rock face, 206 Boulder, 207 Large boulder, 208 Boulder field, 209 Boulder cluster.

Water and marsh
Besides navigation and positioning, this group is important to the competitor as it facilitates the interpretation of height (what is "up" and what is "down") in maps with complex contouring.
305 Crossable watercourse, 306 Crossable small watercourse

Open land and vegetation
The representation of vegetation is of importance to the competitor mainly for navigational purposes, but could be used for route choices in cases where the competitor chooses to try shortcuts in free terrain. In order not to destroy legibility of the green tracks, all vegetation screens must be drawn with the symbol 406 Forest: Slow running.
401 Open land, 402 Open land with scattered trees, 403 Rough open land, 404 Rough open land with scattered trees, 405 Forest: easy running, 406 Forest: slow running, 412 Orchard, 413 Vineyard, 414 Distinct cultivation boundary, 416 Distinct vegetation boundary, 417 Indistinct vegetation boundary, 418, 419, 420 Special vegetation features.

Man-made features
501 Motorway, 502 Major road, 503 Minor road, 504 Road, 509 Narrow ride, 513 Crossing point with bridge, 515 Railway, 516 Power line, 517 Major power line, 518 Tunnel, 519 Stone wall, 521 High stone wall, 522 Fence, 524 High fence, 525 Crossing

point, 526 Building, 527 Settlement, 528 Permanently out of bounds, 529 Paved area, 531 Firing range, 534 Uncrossable pipeline, 535 High tower, 536 Small tower, 539, 540 Special man-made features.

509 Narrow ride is used for unploughed paths if well visible in the terrain.

7.2 The sizes of symbols in different scales

Scale	Track symbols	Other symbols
1:15 000	As specified in this publication	As specified in this publication
1:12 500 (Supporting Scale)	As specified in this publication (same as 1:15 000)	Enlargement (1.2x) from 1:15 000 map
1:10 000	As specified in this publication (same as 1:15 000)	Enlargement (1.5x) from 1:15 000 map
1:7 500 (Supporting Scale)	Enlargement (1.33x) from 1:15 000/1:10 000 map	Enlargement (1.5x) from 1:15 000 map (same as 1:10 000)
1:5 000	Enlargement (1.5x) from 1:15 000/1:10 000 map	Enlargement (1.5x) from 1:15 000 map (same as 1:10 000)

The width of the contour lines can be narrower (0.11 mm), so that the track symbols will be shown more clearly.

The official map scales for all IOF ski orienteering events are 1:15000, 1:10000 and 1:5000. The IOF event adviser may, based on specific reasons described earlier in this document, allow the use of supporting map scales 1:12500 and 1:7500.

7.3 Discipline-specific symbols

The following symbols are introduced for ski orienteering maps.

Track symbols
The track network is indicated by a variety of green line symbols. The symbols are drawn with a compact and clearly visible green colour (PMS 354 is recommended). When a track follows a path, the path is not shown (i.e. black is not used).

Contrary to all other skiable routes (marked in green), opened skiable roads are shown with a black line symbol because roads need to be distinguished from ski tracks. The skiing conditions on a road are different from those on a ski track made for skiing only. The conditions on a road can also change more rapidly (e.g. rain, snow fall, sunshine).

All junctions and crossings must be drawn solid in order to clarify the exact position of the junction or crossing. This is valid also for dotted tracks.

801 Very wide track > 3 m
Colour: upper green (PMS 354)
Width 0.85 mm

Very fast, wide ski tracks in ski centres, made with a ski trail groomer or a track leveller.

802 Wide track 1.5-3.0 m
Colour: upper green (PMS 354)
Width 0.60 mm

A fast, skateable track made by a snow mobile, width usually 2-3 m. Skateable tracks rougher and softer than the wide skateable tracks in the area.

803 Track 0.8-1.5 m
Colour: upper green (PMS 354)
Width: 0.5 mm
Length of a line 3 mm and distance between lines 0.5 mm

A good track made by a snow mobile, usually 1-1.5 m wide. In steep slopes, tracks may be made wider to reduce widening during competition.

804 Track, slow 0.8-1 m
Colour: upper green (PMS 354)
Diameter of dots 0.7 mm and distance between dots 1.3 mm

A rough, slow track with little snow or some brushwood. This symbol is not used in steep slopes, if the width of the track allows using herringbone steps for uphill, or snow plowing technique for slowing and stopping.

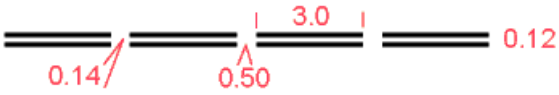
In order to clarify a junction, the beginning of a slow track is drawn with a short line.

805 Road covered with snow
Colour: black
Width of line 0.7 mm

Snowploughed, skiable roads are drawn with a normal road symbol but wider.

806 Sanded or snowless road
Colour: upper purple
Height 3.0 mm

A road on the map which is sanded or snowless during the competition. A chain of V-marks across the road symbol show that the road is not skiable.



807 Unploughed road
Colour: black

A road which is not opened for traffic, no skiable track.

808 Prepared area
Colour: upper green (PMS 354)
Width of line 0.2 mm, distance between lines 0.8 mm, angle 45^{O}

Slalom slopes (alpine skiing slopes) and other areas which are wide, skiable and hard. The boundaries of prepared areas are shown with a narrow green line (0.13 mm) so every edge can be read clearly.

809 Forbidden route
Colour: upper purple
Two purple lines across each other, length 3.5 mm

The symbol 711 Forbidden route is drawn in a bigger size in a ski orienteering map so that it is more clearly visible in the track network.

813 Public snow mobile route
Colour: upper green (PMS 354)

A public and marked route for snow mobiles that may be in use during the ski orienteering competition. These routes are often uneven and of varying width and quality. The organizers must inform competitors in the competition instructions about the quality of such routes (e.g. with photographs) and ensure the safety of the competitors by temporarily closing the route, manning the route or by other means informing any

snow mobile drivers about the possiblity of encountering ski orienteers on the route. If the safety of the competitors can not be guaranteed, the IOF event adviser must mark the route as forbidden and ensure safe passages.

Other symbols

810 Control point and focus point
Colours: control point: lower purple, focus point: upper purple
Diameter of control circles 5.5 – 6.0 mm (same in all scales), width of line 0.5 mm, diameter of focus point 0.65 mm

The focus point (i.e. the point in the centre of a control circle) can be used when it is necessary to clarify the exact position of a control for instance in a dense track network. In ski orienteering, a control is preferably placed in one track only, not in crossings or junctions. A focus point helps specify the exact track where a control is situated.

811 Control number and control code
Colour: upper purple

In ski orienteering, control descriptions are not used. Code numbers for controls are placed either next to control numbers on the terrain area of a map or on a separate control code list. The map size and the shape of the course are important factors in determining which alternative is better. If the track network is dense and/or the shape of the course is complicated, the column should be chosen. There is a hyphen between a control number and a code number.

812 Equipment deposit
Colour: upper purple
Height: approx. 10 mm

A deposit for spare equipment in the terrain.

301.1 Crossable waterbody
Colour: 50 % blue

When a body of water can be safely crossed, the colour shall be blue 50 %, so that the track symbols drawn can be read more clearly.

The bank line of the crossable waterbody is not presented in ski orienteering map.

301.2 Uncrossable waterbody (forbidden to cross)
Colour: 100 % blue
Outline: Width of line 0.18 mm, black

When a body of water is not covered with ice or is otherwise dangerous to cross, the colour of the area shall be blue 100 %. That means also that the area is forbidden to cross.

A black bank line indicates that the feature cannot be crossed.

310.1 Marsh (in ski orienteering map)
Colour: 50 % blue

The marshes shall be shown with the same symbol as indistinct marsh (311) in foot orienteering map, so that the track symbols drawn can be read more clearly.

The colour yellow 50 % shall be used with the symbol, if there are no trees or bushes.