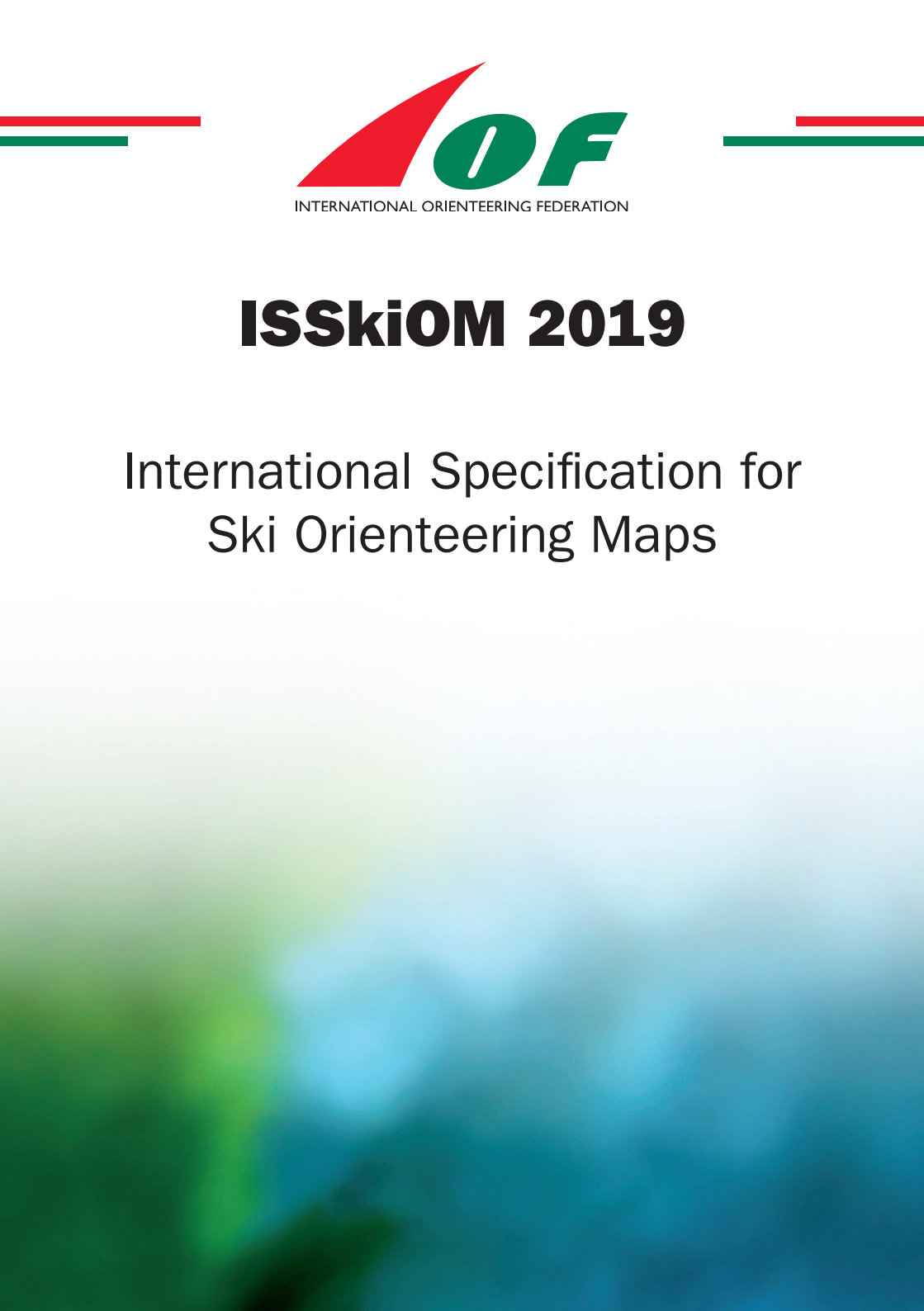
INTERNATIONAL ORIENTEERING FEDERATION

ISSkiOM 2019

International Specification for Ski Orienteering Maps



Errata (changes to the document):

Date	Nr	Symbol	Description
06.03.2020	803	Track 1.0 - 1.5 m	Correction of symbol name to: Track 0.8 - 1.2 m

This International Specification for Ski Orienteering Maps (ISSkiOM 2019) has been compiled and edited by the IOF Map Commission (August 2019).

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IOF INTERNATIONAL SPECIFICATION FOR SKI ORIENTEERING MAPS

1 INTRODUCTION

Maps for ski orienteering are based on the current IOF International Specifications for Orienteering Maps. However, in order to meet the specific requirements of the discipline, certain deviations and additions to the orienteering map specifications are needed. These special rules and symbols are described in this booklet.

Ordinary 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, deviations from the specifications are only allowed with permission from the IOF Ski Orienteering Commission.

1.1 Conventions

Several words are used to signify the requirements in this specification:

- *Must / Shall / Required* mean that the definition is an absolute requirement.
- *Must not / Shall not* mean that the definition is an absolute prohibition.
- *Should / Recommended* mean that there may exist valid reasons in particular circumstances to ignore a particular item, but the full implications must be understood and carefully weighed before choosing a different course.
- *Should not / Not recommended* mean that there may exist valid reasons in particular circumstances when the particular behaviour is acceptable or even useful, but the full implications should be understood and the case carefully weighed before implementing any behaviour / action described with this label.
- *May / Optional* mean that an item is truly optional.

2 GENERAL REQUIREMENTS

2.1 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 a 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 the 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.

2.2 Scale

The map scales in official IOF ski orienteering events are:

- 1:15 000 in long distance events,
- 1:10 000 in middle distance and relay events and
- 1:5 000 in sprint and sprint relay events.

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

- 1:12 500 and 1:10 000 in long distance events and
- 1:7 500 in middle distance and relay events.

For international events supporting scales can be used only with the permission of the IOF Event Adviser, and one or more of the following conditions must be 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 1:15 000 scale.

- When the ski orienteering events are organized at cross-country skiing and biathlon stadiums or centres (where the complex track system is packed within 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 a major part of the terrain and track system is not complex.

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. Therefore, legibility and fairness must be kept in mind when deciding the map scale for an event.

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.

The map handed out to the competitors should not be larger than is necessary for the ski orienteering competition. For practical reasons (size of map holders, avoiding folding and ease of handling in general), the map size for ski orienteering competition maps should not exceed A4 (210 mm by 297 mm).

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

2.4 Colours and reproduction
The document *ISOM Appendix 1 - CMYK Printing and Colour Definitions* shall be applied. Ski orienteering maps add a new colour (Green for SkiO: CMYK 91_0_83_0) for tracks, prepared areas and public snow mobile routes.

Colour deficient orienteers are very sensitive to variations in colours. The colours used in the IOF map specifications have been chosen with colour deficient orienteers in mind. It is therefore very important to make sure that the colours on the printed orienteering maps are as close as possible to the colours specified in the IOF map specifications.

Ski orienteering maps must be printed on good quality paper, preferably water-resistant (weight 100 - 120g / m²). The paper must not be laminated. Colours must be waterproof.

Ski orienteering maps are often updated very close to the competition. The track network may be revised only hours before the event. Therefore laser printing should be used for ski orienteering maps. The print quality needs to be excellent, both with respect to colour fidelity and resolution.

2.5 Course
Control points and the connection lines between the control points shall be printed under the ski tracks; the focus point and all other course planning symbols shall be printed above the ski tracks. Connecting lines must be cut to make the track system and other important map detail readable. Control numbers and control codes must be placed carefully to avoid hiding map features and tracks that are important for the competitor. An optional white outline may be used for control numbers and control codes.

3 RECOMMENDED SYMBOLS

3.1 Use of symbols from the orienteering map specification
The following symbols from the orienteering map specification (ISOM 2017) are recommended for ski orienteering maps:

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 should be more generalised compared to orienteering maps. Form lines shall be omitted if they are not essential.

Contour (101), *Index contour* (102), *Form line* (103), *Earth bank* (104), *Earth wall* (105), *Erosion gully* (107), *Small knoll* (109), *Small depression* (111).

Rock and boulders

Rocks and boulders may be prominent and can therefore serve as valuable objects for navigation and positioning. They may also constitute a danger to the competitor. The map may show these features when they are visible also when covered with snow.

Impassable cliff (201), *Cliff* (202), *Boulder* (204), *Large boulder* (205), *Gigantic boulder or rock pillar* (206), *Boulder cluster* (207), *Boulder field* (208), *Dense boulder field* (209).

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.

Crossable watercourse (304), *Small crossable watercourse* (305). In addition there are special versions in ski orienteering maps of *Body of water* (301.1 and 301.2) and *Marsh* (310.1).

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 *Vegetation: slow running* (406).

Open land (401), *Open land with scattered trees* (402), *Rough open land* (403), *Rough open land with scattered trees* (404), *Forest* (405), *Vegetation: slow running* (406), *Orchard* (413), *Vineyard or similar* (414), *Distinct cultivation boundary* (415), *Distinct vegetation boundary* (416) only the black dotted line, *Prominent vegetation feature* (419).

Man-made features

Man-made features may be important features for navigation.

Paved area (501), *Wide road* (502), *Road* (503), *Vehicle track* (504), *Narrow ride or linear trace through the terrain* (508), *Railway* (509), *Power line, cableway or skilift* (510), *Major power line* (511), *Bridge / tunnel* (512), *Wall* (513), *Impassable wall* (515), *Fence* (516), *Impassable fence* (518), *Crossing point* (519), *Area that shall not be entered* (520), *Building* (521), *High tower* (524), Small tower (525), *Prominent impassable line feature* (529), *Prominent man-made features* (530, 531).

Narrow ride or linear trace through the terrain (508) is used for unploughed paths if clearly visible in the terrain.

Technical symbols

Magnetic north line (601).

3.2 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 may be thinner (0.11 mm), so that the track symbols will be shown more clearly.

See also *Ski Orienteering Map - Scales and symbols sizes.*

3.3 Discipline-specific symbols

Definitions of features to be mapped and specifications of map symbols are given in the following sections. Symbols are classified into three categories:

- Track symbols
- Course planning symbols
- Other symbols

Note: dimensions are specified in mm at the scale of 1 : 15 000.
All drawings are at double scale for clarity only.

Type of symbols:
P ..... Point
L ..... Line
A ..... Area
T ..... Text

< gap or infill between two lines
– line thickness
⎓ distance
ø diameter
(OM) = Outside measure
(CC) = Centre to centre

3.3.1 Track symbols

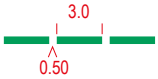
The track network is indicated by a variety of green line symbols. The symbols are drawn with a compact and clearly visible green colour. When a track follows a path, the path is not shown (i.e. black is not used).

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 > 3.0 m (L)
Very fast, wide ski tracks in ski centres, made with a ski trail groomer or a track leveller.
Colour: Green for SkiO

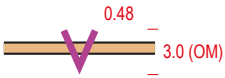
802 Wide track 1.5 - 3.0 m (L)
A fast, skateable track made by a snow mobile, width usually 1.5 - 3.0 m. Skateable tracks rougher and softer than the wide skateable tracks in the area.
Colour: Green for SkiO



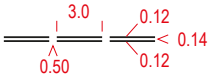
803 Track 0.8 - 1.2 m (L)
A good track made by a snow mobile, usually 0.8 - 1.2 m wide. In steep slopes, tracks may be made wider to reduce widening during competition.
Colour: Green for SkiO

804 Track, slow 0.8 - 1.0 m (L)
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.
Colour: Green for SkiO

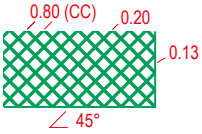
805 Road covered with snow (L)
Snowploughed, skiable roads are drawn with a normal road symbol but wider
Colour: black



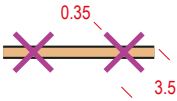
806 Sanded or snowless road (L)
A road on the map which is sanded or snowless during the competition. A chain of V-marks across the road symbol show that the road is not skiable. Snowless roads and heavily sanded roads should normally be marked as forbidden routes.
Colour: purple (upper purple)



807 Unploughed road (L)
A road which is not opened for traffic, not a skiable track.
Colour: black

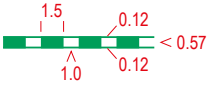


808 Prepared area (A)
Slalom slopes (alpine skiing slopes) and other areas which are wide, skiable and hard. The boundaries of prepared areas are shown with a narrow green line (0.13 mm) so every edge can be read clearly.
Colour: Green for SkiO



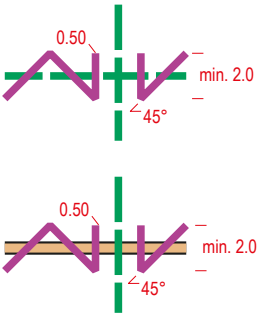
809 Forbidden route, crossable (L)

Linear features marked with the forbidden route symbol can be crossed but not followed. At least two symbols must be used to mark a forbidden route.
The symbol *Forbidden route* (711) is drawn in a larger size in a ski orienteering map so that it is more clearly visible in the track network.
Colour: purple (upper purple)



813 Public snow mobile route (L)

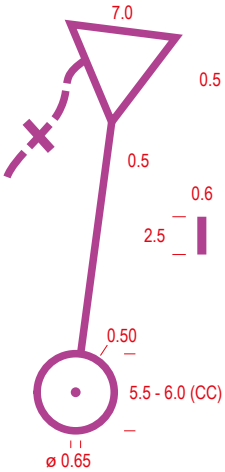
A public and marked route for snow mobiles that may be in use during the ski orienteering competition. These routes are often uneven and of varying width and quality. The organizers must inform competitors in the competition instructions about the quality of such routes (e.g. with photographs) and ensure 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 cannot be guaranteed, the route must be marked as forbidden and safe passages must be ensured.
Colour: Green for SkiO



814 Forbidden route, forbidden to cross (L)

Linear features marked with the forbidden route symbol can not be followed, and can not be crossed except at specially marked crossing points. Do not enter road regardless of whether the road is badly plowed, ice-covered, no traffic etc.
A route which is out of bounds and forbidden to cross is shown with a zigzag. The zigzag line should be as continuous as possible. If there is a crossing point over the forbidden route, it shall be presented like a gate by two perpendicular lines over the forbidden route. Also a longer crossing section shall be presented clearly on the map by using the perpendicular lines at the end of the zigzag lines.
Colour: purple (upper purple)

3.3.2. Course planning symbols

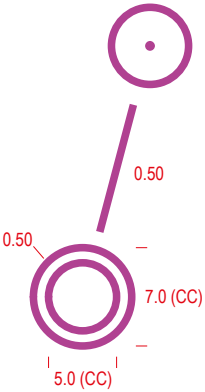


701 Start (P)
The place where the orienteering starts. The centre of the triangle shows the precise position where the orienteering course starts. The start must be on a clearly identifiable point on the map. The triangle points in the direction of the first control.
Colour: purple (upper purple)

702 Map issue point (P)
If there is a marked route to the start point, the map issue point is marked using this symbol.
Colour: purple (upper purple)

703 Control point and focus point (P)
The focus point (i.e. the point in the centre of a control circle) shall be used to clarify the exact position of a control.
Colours: purple (lower purple, except focus point)

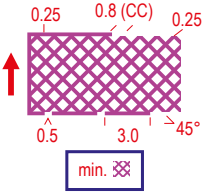
704 Control number and control code (T)
In ski orienteering, control descriptions are not used. Code numbers for controls are placed either next to control numbers on the terrain area of a map or on a separate control code list. The map size and the shape of the course are important factors in determining 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 the control number and the control code. A white outline with 0.15 mm may be used optionally.
Font: Arial, 4.0 mm, non-bold, non-italic.
Colour: purple (upper purple)



705 Course line (L)
Where controls are to be visited in order, the sequence is shown using straight lines from the start to the first control and then from each control to the next one. Sections of lines should be omitted to leave important detail showing. The line should be drawn via mandatory crossing points. There should be gaps between the line and the control circle in order to increase the readability of the underlying detail close to the control.
Colour: purple (lower purple)

706 Finish (P)
The end of the course.
Colour: purple (upper purple)

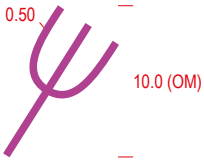
707 Marked route (L)
A marked route that is a part of the course. It is mandatory to follow the marked route.
Minimum length: 2 dashes (4.5 mm – footprint: 67.5 m).
Colour: purple (upper purple)



709 Out-of-bounds area (A)
An out-of-bounds area. A bounding line may be drawn if there is no natural boundary, as follows:

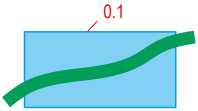
- a solid line indicates that the boundary is marked continuously (tapes, etc.) in the terrain,
- a dashed line indicates intermittent marking in the terrain,
- no line indicates no marking in the terrain.

An out-of-bounds area shall not be entered.
Minimum area: 2 mm x 2 mm (footprint 30 m x 30 m).
Colour: purple (upper purple)

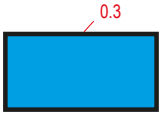


715 Equipment deposit (P)
A deposit for spare equipment in the terrain.
Colour: purple (upper purple)

3.3.3. Other symbols



301.1 Crossable body of water (A)
When a body of water is allowed to be crossed, the colour shall be 50% blue. The bank line of the crossable waterbody is presented in ski orienteering map like in ISOM *Shallow body of water* (302).
Colour: blue (outline), blue (50%)



301.2 Body of water that shall not be crossed (A)
When a body of water is not covered with ice or shall not be crossed, the colour of the area shall be 100% blue. A black bank line indicates that the feature shall not be crossed.
Colour: black (outline), blue

310.1 Marsh (in ski orienteering map) (A)
The marshes shall be shown with the same symbol as *Indistinct marsh* (310) in the orienteering map specification, so that the track symbols drawn can be read more clearly.
Colour: blue (50%)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