



ISSprOM 2019

International Specification for
Sprint Orienteering Maps

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IOF INTERNATIONAL SPECIFICATION FOR SPRINT ORIENTEERING MAPS

1 INTRODUCTION

The sprint orienteering format has been defined by the IOF as follows:

Sprint orienteering is a fast, visible, easy-to-understand format, allowing orienteering to be staged within areas of significant population. The sprint profile is high speed. Sprint is built on very high speed running in very runnable parks, streets or forests.

The main characteristics of this specification:

- It is based on the ISOM 2017; but competitors and mapmakers must understand that sprint maps are special maps.
- Many of the requirements in ISOM 2017 will also apply to sprint maps.
- The most important difference between ISOM 2017 and this specification is that thick black lines are only used for uncrossable features.

Sprint orienteering differs from the longer established forms of foot orienteering. Whilst foot orienteering events traditionally have been staged mainly in forested areas, sprint events can be staged in any type of terrain. The use of parks and urban terrain in particular has important advantages: it brings the sport to where people are, and offers opportunities for increasing public and media awareness of orienteering, in accordance with the objectives of the Leibnitz Convention.

To achieve fairness, it is necessary for mapmakers and course planners to collaborate more closely than for other disciplines. The correct mapping of reduced running speed, both to degree and extent, is extremely important for sprint orienteering because of the short winning times.

In urban areas, it is not unusual to find multilevel areas. ISSprOM allows for the representation of simple underpasses and overpasses.

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 PRINCIPLES

2.1 Map legibility

Map legibility depends on the chosen map scale and a well-chosen set of symbols as well as the application of generalisation rules. The ideal representation would be realised if every feature could be represented in true shape. Obviously, this is impossible, and an effort to draw each feature true to scale would result in a map impossible to read. Depending on the chosen map scale, some symbols must represent features and be exaggerated in size, often far beyond the actual ground limits of the feature represented. In addition, not all features are essential for the purpose of the map.

Features that are important for navigation indicate runnability, or which are uncrossable in sprint orienteering, have been listed in Chapter 4. Features that are not important for a competitor taking part in a sprint orienteering event should not be mapped. Examples of this are waste baskets, fire hydrants, parking meters and individual street lights.

2.2 Barriers - Black line width is used to show passability

It is impossible to declare an exact height when an obstacle becomes impassable. Effective passability depends very much on the physical characteristics of the competitors such as body height and strength.

- Barriers, such as high walls, high fences and high rock faces, affect route choices and shall be represented unambiguously. Therefore, these features shall be represented with a prominent thick black line.
- Obstacles which can be crossed, such as fences and small rock faces, are represented with a significantly thinner black line than the barrier features.
- Features which can be crossed very easily, such as steps and edges of paved areas, are represented with a very thin black line.

This principle makes it impossible to use the road and track symbols of ISOM 2017 in an unmodified form. The large scale of sprint orienteering maps makes it possible for roads and vehicle tracks to be represented in their true shape.

Areas or objects that are forbidden to enter or cross are listed in section 17 of competition rules for orienteering events. Also national rules have to be considered.

2.3 The main ‘running’ level of multilevel structures should be represented

Multilevel structures such as bridges, canopies, underpasses or underground buildings are common in urban areas. The cartographic representation of more than one level is quite difficult. Hence only the main ‘running’ level should be represented on the map. However, underground passages (e.g. underpasses, lighted tunnels) or overpasses (e.g. bridges), which are important for the competitors should be represented on the map. For difficult situations of multilevel representations it is recommended to show it in the bulletin.

3 BASIC ELEMENTS

3.1 Scale

The map scale shall be 1:4 000. The IOF competition rules regulate the use of map enlargements for IOF events. When a map is enlarged, all lines, symbols and screens shall be enlarged proportionally. This also applies to the course planning symbols.

For older age groups where reading fine lines and small symbols may cause problems due to deteriorating vision, enlarged maps are recommended for all formats. Enlargement to the scale 1:3 000 is always recommended for the youngest age groups where the capacity of reading complex maps is not fully developed.

3.2 Contour interval

The contour interval value shall normally be either 2 m or 2.5 m. But in some special cases of steep area 5 m is allowed. The contour is the most important element in the cartographic representation of the terrain and the only one which determines relief forms geometrically. Contour interval, contour line width and map scale should therefore be balanced in order to obtain maps with similar brownness for the same terrain using all foot orienteering map specifications. The ISSPrOM contour interval has been chosen to correspond with the ISOM contour interval regarding brownness (taking into account line width and scale).

3.3 Dimensions of map symbols

No deviations from the given dimensions within these specifications are permitted. It is however accepted that due to limitations in printing technology the final map symbol dimensions may vary up to +/- 5%.

Dimensions in this book are given at the printed scale of 1:4 000.

All line widths and symbol dimensions must be kept strictly to their specified value. Certain minimum dimensions must also be observed. These are based on both printing technology and the need for legibility.

Minimum dimensions

- Passages between symbols representing impassable / uncrossable features should be 0.4 mm



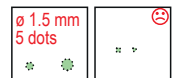
- Gap between two line symbols of the same colour: 0.15 mm
- Gap between line symbols and area symbols of the same colour: 0.15 mm



- Opening of fences and walls: 1.0 mm
- Shortest dotted line: at least two dots
- Shortest dashed line: at least two dashes



- Smallest area enclosed by a dotted line: 1.5 mm (diameter) with 5 dots



Smallest area of colour Blue, green or yellow full colour: 0.5 mm²
 Black dot screen: 0.5 mm²
 Blue, brown, green or yellow dot screen: 1.0 mm²

All features smaller than the dimensions above must be either exaggerated or omitted, depending on whether or not they are of significance to the competitor. When a feature is enlarged, neighbouring features must be displaced so that the correct relative positions are maintained.

Minimum dimensions for areas

Providing minimum dimensions for areas is difficult as the shape varies. The minimum width is as important as the minimum area. Very thin parts of areas must be exaggerated. Minimum widths for area symbols (if not specified for the symbol):

100% green: 0.25 mm (footprint 1 m).

100% yellow: 0.3 mm (footprint 1.2 m).

Colour screens: 0.4 mm (footprint 1.6 m)



Screens

Vegetation, open areas, marshes, etc. are shown with dot or line screens. The following table lists the permissible combinations of screens:

117 Broken ground										117 Broken ground
210 Stony ground										210 Stony ground
309 Uncrossable marsh										309 Uncrossable marsh
310 Marsh	●	●								310 Marsh
311 Indistinct marsh	●	●								311 Indistinct marsh
401 Open land	●	●		●	●					401 Open land
402 Open land with scattered trees	●	●		●	●					402 Open land with scattered trees
403 Rough open land	●	●	●	●	●					403 Rough open land
404 Rough open land with scattered trees	●	●	●	●	●					404 Rough open land with scattered trees
406 Vegetation: slow running	●	●		●	●					406 Vegetation: slow running
407 Vegetation: slow running, good visibility	●	●		●	●		●	●		407 Vegetation: slow running, good visibility
408 Vegetation: walk	●	●		●	●					408 Vegetation: walk
409 Vegetation: walk, good visibility	●	●		●	●		●	●		409 Vegetation: walk, good visibility
410 Impassable Vegetation	●	●		●	●					

Other symbols (like 213, 412, 413, 414, 501, 520) cannot be combined with other symbols.

3.4 Format of the map

The map format should not exceed DIN A3.

3.5 Colour Concept

The document ISOM Appendix 1 - CMYK Printing and Colour Definitions applies.

4 DEFINITION OF SYMBOLS

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

Landforms	(brown)
Rock and boulders	(black+grey)
Water and marsh	(blue)
Vegetation	(green+yellow)
Man-made features	(black)
Technical symbols	(black+blue)
Course planning symbols	(purple)

Note: dimensions are specified in mm at the scale of 1:4 000.
All drawings are at double scale for clarity only.

Type of symbols:

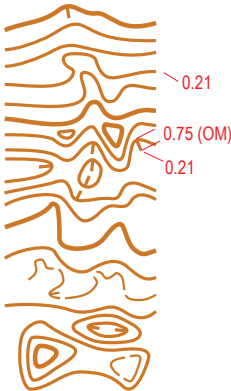
P	Point
L	Line
A	Area
T	Text

<	gap or infill between two lines
-	line thickness
-	distance
⊘	diameter
↑	symbol orientated to north
(OM)	= Outside measure
(IM)	= Inside measure
(CC)	= Centre to centre

Most of the symbols in this specification shall be orientated to north. That a symbol is to be orientated to north is indicated with an arrow pointing upward beside the symbol. When a symbol shall be orientated to north, it means that it shall be orientated to magnetic north and hence relative to the edges of the paper and the magnetic north lines.

For area symbols, colour percentages are given in the text ("green 50%") and the illustrations ("50%"). Detailed graphical definitions for some of the symbols are provided in section 4.8 *Precise definitions of symbols*.

4.1 Landforms



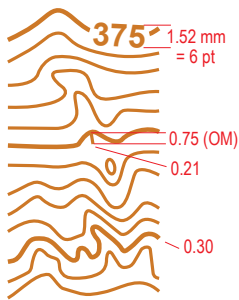
101 Contour (L)

A line joining points of equal height. The standard vertical interval between contours is 2 or 2.5 m. To emphasize the 3-dimensional effect of the contour line image, contour lines shall be represented as continuous lines through all symbols, also *Building* (521) and *Canopy* (522).

Slope lines may be drawn on the lower side of a contour line to clarify the direction of slope. When used, they should be placed in re-entrants.

However, contour lines shall be cut out for better legibility, if they touch the following symbols: *Small earth wall* (105), *Small knoll* (109), *Small elongated knoll* (110), *Small depression* (111), *Pit or hole* (112), *Prominent landform feature* (115), *Stairway* (532). The relative height difference between neighbouring features must be represented on the map as accurately as possible. Absolute height accuracy is of less importance. It is permissible to alter the height of a contour slightly if this will improve the representation of a feature. This deviation should not exceed 25% of the contour interval and attention must be paid to neighbouring features. The smallest bend in a contour is 0.4 mm from centre to centre of the line.

Colour: brown.

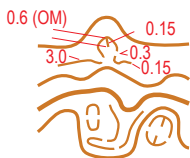


102 Index contour (L, T)

Every fifth contour shall be drawn with a thicker line. This is an aid to the quick assessment of height difference and the overall shape of the terrain surface. Where an index contour coincides with an area of much detail, it may be shown with symbol *Contour* (101).

Contour values may be included to aid assessment of large height differences. The labels shall be orientated so that the top of the label is on the higher side of the contour. They are inserted in the index contours in positions where other detail is not obscured.

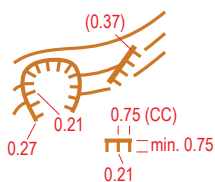
Colour: brown.



103 Form line (L)

An intermediate contour line. Form lines are used where more information can be given about the shape of the ground. They are used only where representation is not possible with ordinary contours. Only one form line may be used between neighbouring contours.

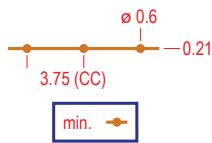
Colour: brown.



104 Earth bank (L)

A steep earth bank is an abrupt change in ground level which can be clearly distinguished from its surroundings, e.g. gravel or sand pits, roads and railway cuttings or embankments. The tags should show the full extent of the slope, but may be omitted if two banks are close together. Impassable banks shall be drawn with the symbol *Impassable cliff* (201). The line width of very high earth banks may be 0.37 mm.

Colour: brown.



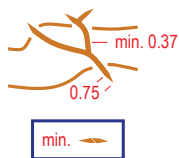
105 Small earth wall (L)

A small distinct earth wall, usually man-made. Larger earth walls should be represented with the symbols *Contour* (101), *Form line* (103) or *Earth bank* (104).

Minimum height: 0.5 m.

Minimum length: 1.4 mm (footprint 5,6 m).

Colour: brown.



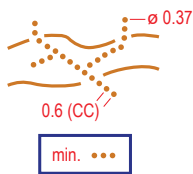
107 Erosion gully or trench (L)

An erosion gully or trench which is too small to be represented with the symbol *Earth bank* (104), *Contour* (101), *Index contour* (102) or *Form line* (103) is represented by a single line. The end of the line is pointed. Contour lines may be broken around this symbol for better readability.

Minimum depth: 1 m.

Minimum length: 2.0 mm (footprint 8 m).

Colour: brown.



108 Small erosion gully (L)

A small erosion gully or trench. Contour lines should be broken around this symbol.

Minimum depth: 0.5 m.

Minimum length (isolated): three dots (1.6 mm - footprint 6.4 m).

Colour: brown.



109 Small knoll (P)

A small obvious mound or rocky knoll which cannot be drawn to scale with a *Contour* (101), *Index contour* (102) or *Form line* (103). The symbol shall not touch or overlap contours.

Minimum height: 0.5 m.

Footprint: 3 m in diameter.

Colour: brown.



110 Small elongated knoll (P)

A small obvious elongated knoll which cannot be drawn to scale with a *Contour* (101), *Index contour* (102) or *Form line* (103). The maximum length should be 6 m and the maximum width 2 m. Knolls larger than this shall be shown by contours. The symbol shall not be drawn in free form or such that two elongated knoll symbols touch or overlap. The symbol shall not touch or overlap contours.

Minimum height: 0.5 m.

Footprint: 4.8 m x 2.4 m.

Colour: brown.



111 Small depression (P)

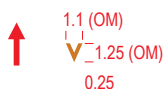
A small shallow natural depression or hollow which cannot be represented by the symbol *Contour* (101) or *Form line* (103) is represented by a semicircle. The symbol shall not touch or overlap other brown symbols. The symbol is orientated to north.

Minimum depth: 0.5 m.

Minimum width: 1 m.

Footprint: 4.8 m x 2.4 m.

Colour: brown.



112 Pit or hole (P)

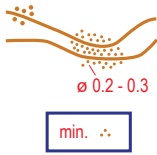
A pit or hole with distinct steep sides which cannot be represented to scale with the symbol *Earth bank* (104). The symbol is orientated to north.

Minimum depth: 0.5 m.

Minimum width: 1 m.

Footprint: 4.4 m x 5.0 m.

Colour: brown.



113 Broken ground (A)

An area of pits or knolls, which is too complex to be represented in detail. The density of randomly placed dots may vary according to the detail on the ground. The dots shall not interfere with the representation of important terrain features or objects. Contours shall not be cut in broken ground areas. Dots shall not be arranged to form a single point wide line.

Colour: brown.



115 Prominent landform feature (P)

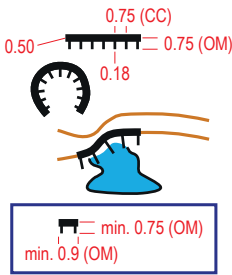
A small landform feature which is significant or prominent. The symbol is orientated to north. The symbol shall not touch or overlap contour lines or other brown symbols.

The definition of the symbol must be given on the map.

Footprint: 5.4 m x 4.6 m.

Colour: brown.

4.2 Rock and boulders

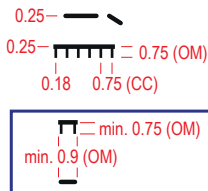


201 Impassable cliff (L)

An impassable cliff, quarry or earth bank (see symbol *Earth bank* 104). Tags are drawn downwards, showing its full extent from the top line to the foot. For vertical rock faces the tags may be omitted if space is short, e.g. narrow passages between cliffs (the passage should be drawn with a width of at least 0.4 mm). The tags may extend over an area symbol representing detail immediately below the rock face. When a rock face drops straight into water, making it impossible to pass under the cliff along the water's edge, the bank line is omitted or the tags shall clearly extend over the bank line. An impassable cliff should interplay with the contour lines. An impassable cliff shall not be passed. Minimum height: 1.5 m.

Minimum length: 0.9 mm (footprint 3.6 m).

Colour: black.



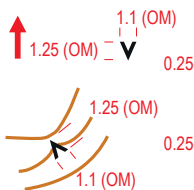
202 Passable rock face (L)

A passable cliff or quarry.

A small vertical rock face may be shown without tags. If the direction of fall of the rock face is not apparent from the contours, or to improve legibility, short tags should be drawn in the direction of the fall. For non-vertical cliffs, the tags should be drawn to show the full horizontal extent. For passable rock faces shown without tags the end of the line must be rounded to improve legibility. Minimum height: 0.6 m.

Minimum length: 0.9 mm (footprint 3.6 m).

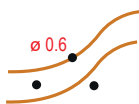
Colour: black.



203 Rocky pit or cave (P)

A rocky pit, hole, cave or mineshaft which may constitute a danger to the competitor. Location is the centre of gravity of the symbol, and the symbol shall be orientated to north, except for caves with a distinct entrance, where the symbol should point into the cave.

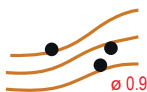
Minimum depth: 0.5 m.
Footprint: 4.4 m x 5.0 m.
Colour: black.



204 Boulder (P)

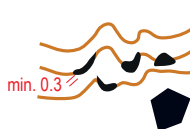
A small distinct boulder. Every boulder marked on the map shall be immediately identifiable on the ground.

Footprint: 2.4 m in diameter.
Colour: black.



205 Large boulder (P)

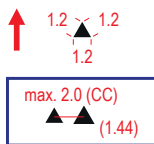
A particularly large and distinct boulder. Footprint: 3.6 m in diameter.
Colour: black.



206 Gigantic boulder or rock pillar (A)

A gigantic boulder, rock pillar or massive cliff shall be represented in plan shape. The objects can vary in shape and width.

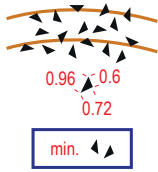
The gap between gigantic boulders or between gigantic boulders and other impassable feature symbols must exceed 0.15 mm on the map.
Minimum width: 0.3 mm.
Minimum area: 0.75 mm² (footprint 12 m²)
Colour: black.



207 Boulder cluster (P)

A distinct group of boulders so closely clustered together that they cannot be marked individually. The boulders in the cluster should be higher than 0.5 m. A boulder cluster must be easily identifiable as a group of boulders. To be able to show the distinction between neighbouring (maximum 8 m apart), boulder clusters with significant difference in boulder size, it is permitted to enlarge this symbol by 20% (edge length 1.44 mm) for some of the boulder clusters. The symbol is orientated to north.

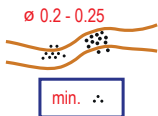
Footprint: 4.8 m x 4.0 m
Colour: black.



208 Boulder field (A)

An area which is covered with so many scattered blocks of stone that they cannot be marked individually is represented with randomly placed and orientated solid triangles. The runnability is reduced and is indicated by the density of the triangles. A minimum of two triangles shall be used. To be able to show obvious height differences within a boulder field, it is permitted to enlarge some of the triangles to 120%.

Colour: black.



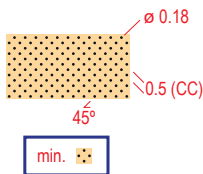
210 Stony ground (A)

An area of stony or rocky ground which reduces runnability.

The dots shall be randomly distributed with density according to the amount of rock but not interfere with the representation of important terrain features or objects. A minimum of three dots shall be used. To avoid confusion with symbol *Distinct vegetation boundary* (416), the dots shall not be arranged to form a line.

Density: Minimum 3 dots.

Colour: black.



213 Open sandy ground (A)

An area of sandy ground or soft gravel with no vegetation which reduces runnability. Where an area of sandy ground is open and has good runnability, it is represented with symbol *Open land* (401), *Open land with scattered trees* (402) or *Paved area* (501). Black dots shall not interfere with black objects.

Minimum width: 0.3 mm

Minimum area: 1 mm² (footprint 16 m²).

Colour: yellow 50%, black.



214 Bare rock (A)

An area of runnable rock without earth or vegetation.

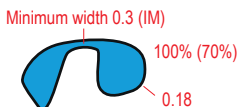
An area of rock covered with grass, moss or other low vegetation shall be represented according to its openness and runnability (401/402/403/404).

Minimum width: 0.25 mm

Minimum area: 1 mm² (footprint 16 m²).

Colour: black 30%.

4.3 Water and marsh



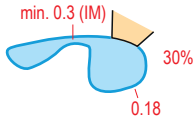
301 Uncrossable body of water (A)

An area of deep water such as a lake, pond, river or fountain. The dark blue colour and the bordering black line indicate that the feature shall not be crossed.

Minimum width: 0.3 mm

Minimum area (inside): 0.5 mm² (footprint 8 m²)

Colour: black (outline), blue 100% or 70% for dominant areas.



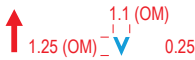
302 Crossable body of water (A)

An area of shallow water such as a pond, river or fountain that can be crossed. The body of water should be less than 0.5 m deep and runnable. If the body of water is not runnable it shall be represented with the symbol *Uncrossable body of water* (301). If no other line symbol touches the border of the passable body of water, the border shall be represented with a blue line.

Minimum width: 0.3 mm

Minimum area (inside): 0.5 mm² (footprint 8 m²)

Colour: blue (outline), blue 30%.



303 Waterhole (P)

A water-filled pit or an area of water which is too small to be shown to scale. Location is the centre of gravity of the symbol, and the symbol is orientated to north.

Footprint: 4.4 m x 5.0 m.

Colour: blue.

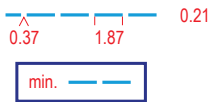


305 Small crossable watercourse (L)

A crossable watercourse less than 2 m wide.

Minimum length: 1 mm (footprint 4 m)

Colour: blue.

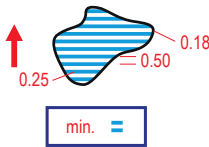


306 Minor / seasonal watercourse (L)

A natural or man-made minor watercourse which may contain water only intermittently.

Minimum length (isolated): two dashes (4.11 mm - footprint 16.5 m)

Colour: blue.



307 Uncrossable marsh (A)

A marsh which is uncrossable or which may constitute a danger to the competitor. The feature shall not be crossed. At least two blue lines shall be clearly visible. The symbol is orientated to north.

Minimum width: 2 lines.

Colour: black (outline), blue.

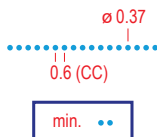


308 Marsh (A)

A crossable marsh, usually with a distinct edge. The symbol shall be combined with vegetation symbols to show runnability and openness. At least two blue lines shall be clearly visible. The symbol is orientated to north.

Minimum width: 2 lines.

Colour: blue.

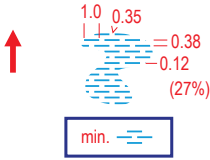


309 Narrow marsh (L)

A marsh or trickle of water which is too narrow to be shown with symbol *Marsh* (310).

Minimum size (isolated): two dots (1 mm - footprint 4 m).

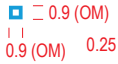
Colour: blue.



310 Indistinct marsh (A)

An indistinct or seasonal marsh or area of gradual transition from marsh to firm ground, which is crossable. The edge is generally indistinct and the vegetation similar to that of the surrounding ground. The symbol shall be combined with vegetation symbols to show runnability and openness. At least three blue lines shall be clearly visible. The symbol is orientated to north.

Colour: blue.



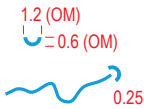
311 Small fountain or well (P)

Small fountain or well which is at least 1 m in diameter.

Minimum height: 0.5 m.

Footprint: 3.6 m x 3.6 m.

Colour: blue.

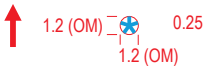


312 Spring (P)

The source of water with a distinct outflow. The symbol is orientated to open downstream.

Footprint: 4.8 m x 2.4 m.

Colour: blue.



313 Prominent water feature (P)

A small water feature which is significant or prominent. The symbol is orientated to north.

The definition of the symbol must be given on the map.

Footprint: 4.8 m in diameter.

Colour: blue.

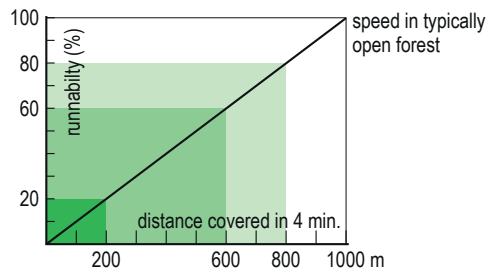
4.4 Vegetation

The representation of vegetation is important to the competitor because it affects runnability and visibility and it also provides features for map reading.

Colour and Runnability

The basic principle is as follows:

- **white** represents typical open forest,
- **yellow** represents open areas divided into several categories,
- **green** represents the density of the forest and undergrowth according to its runnability and is divided into several categories



The runnability depends on the nature of the vegetation (density of trees / scrub and undergrowth: bracken, brambles, nettles, etc.), but runnability is also affected by marshes, stony ground, etc. which are shown by separate symbols.



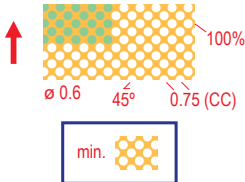
401 Open land (A)

An area of cultivated land, lawn, field, meadow, grassland, bark mulch etc. without trees, offering very good runnability.

Minimum width: 0.3 mm.

Minimum area: 0.5 mm² (footprint 8 m²).

Colour: yellow.



402 Open land with scattered trees (A)

An area of meadows with scattered trees or bushes, with grass or similar ground cover offering very good runnability. The dots may be white (scattered trees) or green (scattered bushes / thickets). Symbols *Prominent large tree* (417) and *Prominent bush or small tree* (418) may be added. The symbol is orientated to north.

Minimum width: 2.2 mm

Minimum area: 6.25 mm² (footprint 100 m²)

Smaller areas must be left out, exaggerated or shown using the symbol *Open land* (401).

Colour: yellow with holes of white or green 60%

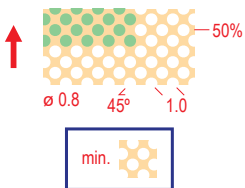


403 Rough open land (A)

An area of heath or moorland, a felled area, a newly planted area (trees lower than ca. 1 m) or other generally open land with rough ground vegetation, i.e. heather or tall grass. This symbol may be combined with symbols *Vegetation: slow running, good visibility* (407) and *Vegetation: walk, good visibility* (409) to show reduced runnability.

Minimum area: 1 mm² (footprint 16 m²).

Colour: yellow 50%.



404 Rough open land with scattered trees (A)

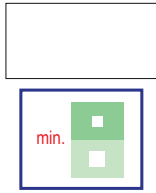
An area of rough open land with scattered trees or bushes. The dots may be white (scattered trees) or green (scattered bushes / thickets). Symbols *Prominent large tree* (417) and *Prominent bush or small tree* (418) may be added. Only the white dot variant can be combined with symbol *Vegetation: slow running, good visibility* (407) or *Vegetation: walk, good visibility* (409) to show reduced runnability.

Minimum width: 2.5 mm.

Minimum area: 6.25 mm² (footprint 100 m²)

Smaller areas must be left out, exaggerated or shown using either the symbol *Rough open land* (403) or *Forest* (405).

Colour: yellow 50% with holes of white or green 60%.



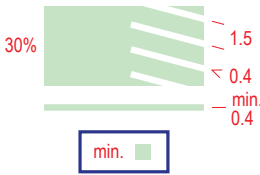
405 Forest (A)

Typical open forest for the particular type of terrain. If no part of the forest is easily runnable then no white should appear on the map.

Minimum width (for openings): 0.3 mm.

Minimum area: 1 mm² (footprint 16 m²) for openings in screens of other colours, except for *Vegetation: walk* (408) and *Open land* (401), where the minimum area is 0.5 mm² (footprint 8 m²).

Colour: white.



406 Vegetation: slow running (A)

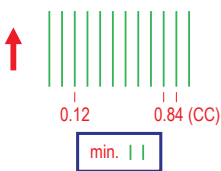
An area with dense vegetation (low visibility) which reduces running to about 60-80% of normal speed.

When runnability is better in one direction a regular pattern of white stripes is left in the screen to show the direction of better running. At least two white stripes shall be clearly visible.

Minimum width: 0.4 mm.

Minimum area: 1 mm² (footprint 16 m²).

Colour: green 30%.



407 Vegetation: slow running, good visibility (A)

An area of good visibility and reduced runnability due to, for instance, undergrowth (brambles, heather, low bushes, cut branches, etc.). Running speed is reduced to about 60-80% of normal speed. This symbol shall not be combined with the symbol *Vegetation: slow running* (406) or *Vegetation: walk* (408).

Minimum width: 2 lines.

Colour: green.



408 Vegetation: walk (A)

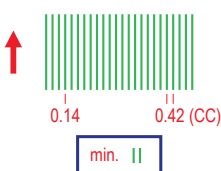
An area with dense trees or thicket (low visibility) which reduces running to about 20-60% of normal speed.

When runnability is better in one direction a regular pattern of white / green 30% stripes is left in the screen to show the direction of better running. At least two stripes shall be clearly visible.

Minimum width: 0.4 mm.

Minimum area: 0.5 mm² (footprint 8 m²).

Colour: green 60%.



409 Vegetation: walk, good visibility (A)

An area of good visibility and reduced runnability due to, for instance, undergrowth (brambles, heather, low bushes, cut branches, etc.). Running speed is reduced to about 20-60% of normal speed. This symbol shall not be combined with the symbol *Vegetation: slow running* (406) or *Vegetation: walk* (408).

Minimum width: 2 lines.

Colour: green.



min.
0.4

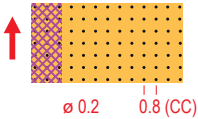
410 Impassable vegetation (A)

An area of dense vegetation (trees or undergrowth) which is impassable. Running speed is almost 0%.

Minimum area: 0.3 mm² (footprint 5 m²). Impassable vegetation shall not be crossed.

Minimum width: 0.4 mm.

Colour: green 100%.

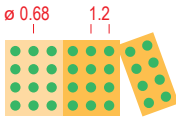


412 Cultivated land (A)

Cultivated land, normally used for growing crops. Runnability may vary according to the type of crops grown and the time of year. Since the runnability may vary, such areas should be avoided when setting courses. The symbol is combined with symbol *Out-of-bounds area* (709) to show cultivated land that shall not be entered. The symbol is orientated to north. Minimum width: 3 mm.

Minimum area: 9 mm² (144 m²).

Colour: yellow, black.



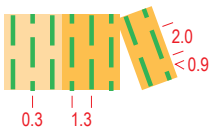
413 Orchard (A)

Land planted with fruit trees or bushes, normally in regular pattern. The dot lines may be orientated to show the direction of planting. At least four dots shall be clearly visible. Must be combined with either symbol *Open land* (401) or *Rough open land* (403).

Minimum width: 2 mm.

Minimum area: 4 mm² (64 m²)

Colour: green, yellow or yellow 50%.



414 Vineyard or similar (A)

A vineyard or similar cultivated land containing dense rows of plants offering good or normal runnability in the direction of planting. The lines shall be orientated to show the direction of planting. At least three lines shall be clearly visible. Must be combined with either symbol *Open land* (401) or *Rough open land* (403).

Minimum width: 2 mm.

Minimum area: 4 mm² (64 m²)

Colour: green, yellow or yellow 50%.

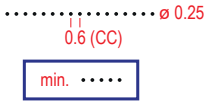


415 Distinct cultivation boundary (L)

A boundary of symbol cultivated land vegetation (401, 412, 413, 414) or a permanent boundary between different types of cultivated land, when not shown with other symbols (fence, wall, path, etc.)

Minimum length: 1 mm (footprint 4 m).

Colour: black.



416 Distinct vegetation boundary (L)

A distinct forest edge or very distinct vegetation boundary within the forest. For indistinct boundaries, the area edges are shown only by the change in colour and / or dot screen.

Minimum length (isolated): five dots (2,65 mm - footprint 10,6 m)

Colour: black.



417 Prominent large tree (P)

A prominent large single tree.

White mask is used under the green circle, to improve readability in yellow and green (OM 1.2 mm).

Footprint: 4 m in diameter (OM 4.8 m).

Colour: green, white.



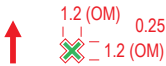
418 Prominent bush or small tree (P)

A prominent bush or a small single tree.

Small white dot inside is used to aid the colour vision impaired.

Footprint: 3.2 m in diameter.

Colour: green.



419 Prominent vegetation feature (P)

A vegetation feature which is significant or prominent.

White mask is used under the green cross, to improve readability in yellow and green (line width of white mask 0.50 mm, and it shall be 0.25 mm longer in the ends of the symbol).

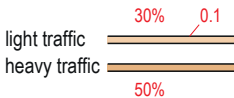
The symbol is orientated to north.

The definition of the symbol must be given on the map.

Footprint: 4.8 m x 4.8 m (OM 7.1 m x 7.1 m).

Colour: green.

4.5 Man-made features

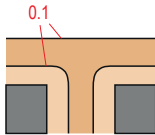


501 Paved area (A)

A paved area is an area with a firm surface such as asphalt, hard gravel, tiles, concrete or the like. It should be bordered (or framed) by the symbol *Step or edge of paved area* (501.1). Distinct differences within the paved area can be represented with the symbol *Step or edge of paved area* (501.1), if they serve navigation. The black border line can be omitted where it is logical (e.g. indistinct / gradual gravel-to-grass transitions).

Differences in the brown colour shall be used to show differences in the traffic of vehicles or pedestrians.

Colour: brown 30% for light traffic of vehicles or pedestrians, 50% for heavy traffic of vehicles or pedestrians, black; the colour and the line width shall be the same as for symbol *Unpaved footpath or track* (505).

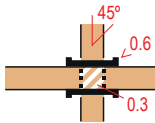


501.1 Step or edge of paved area (L)

An edge of a paved area.

Edges within paved areas are generally not represented, unless they serve navigation.

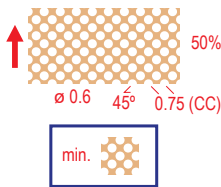
Colour: black.



501.2 Paved area in multilevel structures (A)

Part of a multilevel structure which can be passed at two levels. The angle of the pattern is approximately 45° to the direction of the axis of the paved area.

Colour: brown 30% or 50%, white (If upper level is covered by other surface, that symbol shall occur with the same pattern).



501.3 Paved area with scattered trees (A)

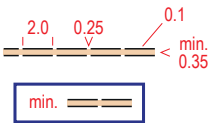
Area with scattered trees or bushes in a paved area.

Minimum width: 2.2 mm

Minimum area: 6.25 mm² (footprint 100 m²)

Smaller areas must be left out, exaggerated or shown using the symbol *Open land* (401).

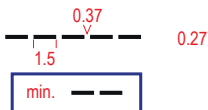
Colour: brown 30% with holes of white.



505 Unpaved footpath or track (L)

An unpaved footpath or rough vehicle track is a way for passing mainly by foot, without a smooth, hard surface. The colour and the line width shall be the same as for the symbols *Paved area* (501) and *Step or edge of paved area* (501.1).

Colour: black, brown 30%.

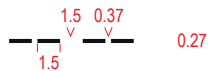


506 Small unpaved footpath or track (L)

A small unpaved footpath or track.

Minimum length (isolated): two dashes (3.4 mm - footprint 13.6 m).

Colour: black.



507 Less distinct small path (L)

A less distinct path or forestry extraction track.

Minimum length: two sections of double dashes (7.9 mm - footprint 31.6 m).

Colour: black.

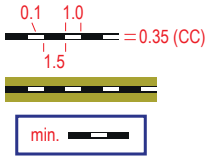


508 Narrow ride (L)

A distinct ride is a linear break in the forest (usually in a plantation), which does not have a distinct path along it. Where there is a path along a ride, the symbol *Small unpaved footpath or track* (506) shall be used.

Minimum length: two dashes (9.75 mm - footprint 39 m).

Colour: black.

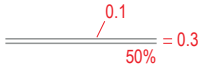


509.1 Railway (L)

A railway is a permanent track laid with rails on which locomotives, carriages or wagons can travel. If it is forbidden to cross or run along the railroad, the forbidden area around the railway shall be represented with symbol *Area that shall not be entered* (520).

Minimum length (isolated): two dashes (4 mm - footprint 16 m).

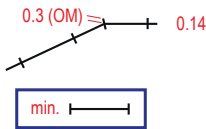
Colour: black, white.



509.2 Tramway (L)

A tramway is a public vehicle running regularly along certain streets, usually on rails. The track can be easily crossed by the competitor. Tramways are generally not represented. However, if they serve navigation or orientation, they can be represented.

Colour: black 50%.

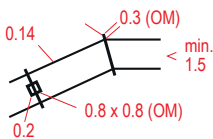


510 Power line, cableway or skilift (L)

Power line, cableway or skilift.

The bars indicate the exact location of the pylons. If a section of a power line, cableway or skilift goes along a road or path (and does not offer significant additional navigational value) it should be omitted.

Colour: black.



511 Major power line (L)

Major power lines should be drawn with a double line. The gap between the lines may indicate the extent of the powerline. Very large carrying masts shall be represented in plan shape using symbol *Building* (521) or *High tower* (524). In this case, the cable lines can be left out (the map shows only the pylons).

Colour: black.

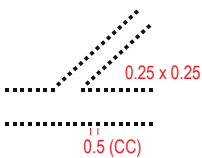


512.1 Bridge (P)

A bridge is a structure spanning and permitting passage over a river, chasm, road or the like.

Colour: black.

If underpasses under bridges are to be used in a competition, they shall be emphasized with the symbol *Crossing point* (710.1) or *Crossing section* (710.2).



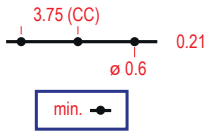
512.2 Underpass or tunnel (L)

An underpass or a tunnel is a passage running underneath the ground or a building, especially a passage for pedestrians or vehicles.

Minimum length (of baseline): 2 squares (0.75 mm - footprint 3.0 m).

Colour: black.

If underpasses or tunnels etc. are to be used in a competition, they shall be emphasized with the symbol *Crossing point* (710.1) or *Crossing section* (710.2).

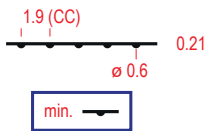


513.1 Passable wall (L)

A passable wall is a construction made of stone, brick, concrete etc., which can be passed. If such a wall is higher than 1.5 m, it shall be represented with the symbol *Impassable wall* (515). Wide walls shall be drawn in plan shape using a ground symbol delineated by the passable wall symbol. It should be dotted if possible (minimum length around the dot 0.4 mm each side)

Minimum length (isolated): 1.4 mm (footprint 5.6 m).

Colour: black.



513.2 Passable retained wall (L)

A passable wall which is seen only from one side. Half dot must point to the lower level.

Height is 0.6 - 1.5 m. If lower, use symbol *Step or edge of paved area* (501.1).

Minimum length (isolated): 2.4 mm (footprint 9.6 m).

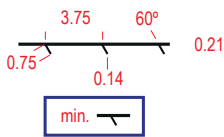
Colour: black.



515 Impassable wall (L)

An impassable or uncrossable wall or retaining wall is a wall, which fulfil the function of an enclosure or solid barrier. It shall not be crossed. Very wide impassable walls shall be drawn in plan shape and represented with the symbol *Building* (521).

Colour: black.



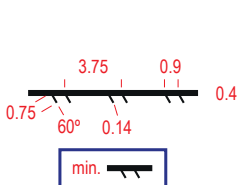
516 Passable fence or railing (L)

A passable fence is a barrier enclosing or bordering a field, yard, etc., usually made of posts and wire or wood. It is used to prevent entrance or to confine or mark a boundary. A railing is a fencelike barrier composed of one or more horizontal rails supported by widely spaced upright poles, usually it can be slipped through.

If a fence or railing is dangerous or very difficult to cross, it shall be represented with the symbol *Impassable fence or railing* (518).

Minimum length (isolated): 2.2 mm (footprint 8.8 m).

Colour: black.

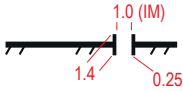


518 Impassable fence or railing (L)

An impassable fence or railing shall not be crossed. If the minimum length is shorter than 3 mm, it must be presented with the symbol *Impassable wall* (515).

Minimum length (isolated): 3 mm (footprint 12 m).

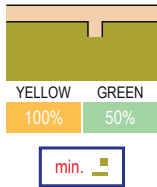
Colour: black.



519 Crossing point (optional) (P)

A crossing point is a gap or an opening in a fence, railing or wall, which can easily be passed through by a competitor. Small gaps or openings which cannot easily be passed through by competitors, shall not be represented on the map and shall be closed during the competition.

Colour: black.



520 Area that shall not be entered (A)

An area that shall not be entered such as a private area, a flower bed, a railway area etc. No feature shall be represented in this area, except very prominent features such as railways, large buildings, or very large trees. Road entrances shall be represented clearly.

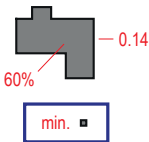
Areas that shall not be entered totally contained within buildings shall be mapped as being a part of the building.

The area shall always be delineated by a boundary line (at least 0.1 mm in width).

Minimum width: 0.25 mm (footprint 1 m).

Minimum area: 0.25 mm² (footprint 4 m²).

Colour: yellow 100%, green 50%.



521 Building (A)

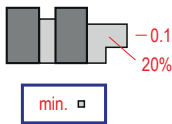
A building is a relatively permanent construction having a roof. Buildings within symbol *Area that shall not be entered* (520) may just be represented in a simplified manner. Areas totally contained within a building shall be mapped as being a part of the building. A building shall not be entered.

The minimum gap between buildings and other impassable features shall be 0.40 mm. Boundaries in touching buildings shall not be represented.

Minimum width: 0.5 mm.

Minimum area: 0.25 mm² (footprint 4 m²).

Colour: black (outline), black 60%.



522 Canopy (A)

A canopy is a building construction (with a roof), normally supported by pillars, poles or walls, such as passages, gangways, courts, bus stops, gas stations or garages. Small passable parts of buildings which cannot easily be crossed by competitors, shall not be represented on the map and shall be closed during the competition.

Minimum width: 0.5 mm.

Minimum area: 0.25 mm² (footprint 4 m²).

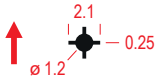
Colour: black (outline), black 20%.



522.1 Pillar (P)

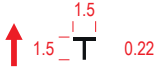
A pillar is an upright shaft or structure of stone, brick or other material, relatively slender in proportion to its height and any shape in section, used as a building support. Pillars smaller than 1 m × 1 m are generally not represented.

Colour: black.



524 High tower (P)

A high tower or large pylon. Very large towers shall be represented in plan shape with the symbol *Building* (521). The symbol is orientated to north.
Footprint: 8.4 m in diameter.
Colour: black.



525 Small tower (P)

An obvious small tower, platform or seat. The symbol is orientated to north.
Footprint: 6 m x 6 m.
Colour: black.



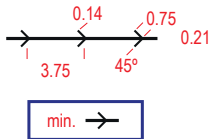
526 Cairn, memorial, small monument or boundary stone (P)

Cairn, memorial, small monument or boundary stone that is obvious. Large massive monuments shall be represented in plan shape with the symbol *Building* (521).
Footprint: 4 m in diameter.
Colour: black.



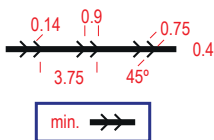
527 Fodder rack (P)

A fodder rack, which is free standing or attached to a tree. The symbol is orientated to north.
Footprint: 6 m x 6 m.
Colour: black.



528 Prominent line feature (L)

A prominent man-made line feature. For example, a low pipeline (gas, water, oil, heat, etc.) or a bobsleigh / skeleton track that is clearly visible. The definition of the symbol must be given on the map.
Minimum length: 2.2 mm (footprint 8.8 m).
Colour: black.



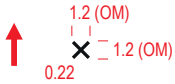
529 Prominent impassable line feature (L)

An impassable man-made line feature. For example, a high pipeline (gas, water, oil, heat, etc.) or a bobsleigh / skeleton track. The definition of the symbol must be given on the map. A prominent impassable line feature shall not be crossed.
Minimum length: 3 mm (footprint 12 m).
Colour: black.



530 Prominent man-made feature – ring (P)

A man-made feature which is significant or prominent. The definition of the symbol must be given on the map.
Footprint: 4 m in diameter.
Colour: black.



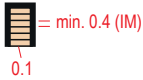
531 Prominent man-made feature – x (P)

Location is at the centre of gravity of the symbol, and the symbol is orientated to north.

The definition of the symbol must be given on the map.

Footprint: 4.8 m x 4.8 m.

Colour: black.



532 Stairway (L)

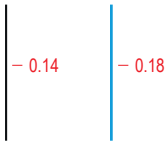
Steps of a stairway shall be represented in a generalized manner.

Minimum length: 3 (graphical) steps.

Minimum width: 0.4 mm (IM).

Colour: black.

4.6 Technical symbols



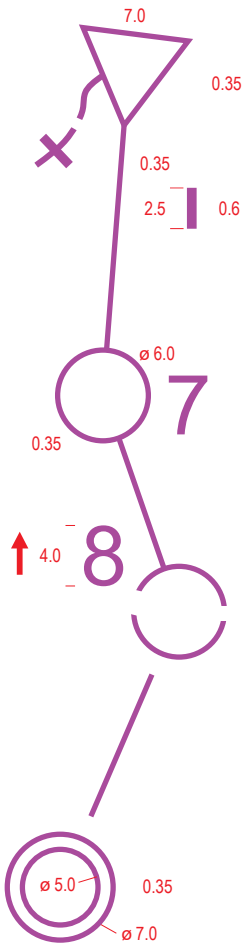
601 Magnetic north line (L)

Magnetic north lines are lines placed on the map pointing to magnetic north.

Their spacing shall be 30 mm, they represent 120 m on the ground. North lines may be broken where they obscure small features such as boulders, knolls, cliffs, stream junctions, path ends, etc.

Colour: black or blue.

4.7 COURSE PLANNING SYMBOLS



701 Start (P)

The start or map issue point (if not at the start) is shown by an equilateral triangle which points in the direction of the first control. The centre of the triangle shows the precise position of the start point.

Colour: purple (under black).

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 (over black).

703 Control point (P)

The control points are shown with circles (footprint 24 m). The centre of the circle shows the precise position of the feature. Sections of circles should be omitted to leave important detail showing.

Colour: purple (under black).

704 Control number (T)

The number of the control is placed close to the control point circle in such a way that it does not obscure important detail. The numbers are orientated to north. An option for heavily building filled map is the possibility to have a white border with 0.1 or 0.15 mm in width.

Font: Arial, 4.0 mm, non-bold, non-italic.

Colour: purple (over black, optional white outline 0.15 mm).

705 Course line (L)

Where controls are to be visited in order, the start, control points and finish are joined together by straight lines. Sections of lines should be omitted to leave important detail showing.

Colour: purple (under black).

706 Finish (P)

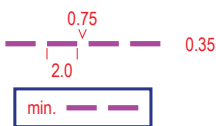
The finish is shown by two concentric circles.

Colour: purple (under black).

707 Marked route (L)

A marked route is shown on the map with a dashed line.

Colour: purple (over black).

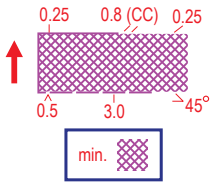




708 Out-of-bounds boundary (L)

An out-of-bounds boundary shall not be crossed. It shall be used for temporary uncrossable boundaries used for the course setting.

Colour: purple (under black).



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:

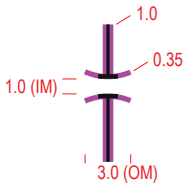
- a solid line indicates that the boundary is marked continuously (tapes, etc.) in the terrain,
- a dashed line indicates intermittent marking in the terrain,
- no line indicates no marking in the terrain.

An out-of-bounds area shall not be entered.

Minimum width: 2 mm.

Minimum area: 4 mm² (footprint 64 m²).

Colour: purple (over black).

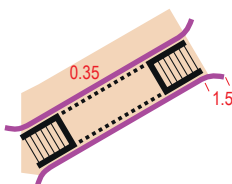


710.1 Crossing point (P)

A crossing point through or over a wall or fence, or across a road or railway or through a tunnel or an out-of-bounds area is drawn on the map with two lines curving outwards.

If underpasses or tunnels etc. are to be used in a competition, they shall be emphasized with symbol *Crossing point (710.1)* or *Crossing section (710.2)*.

Colour: purple (under black).

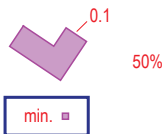


710.2 Crossing section (L)

A crossing section through or over a building, wall or fence, or across a road or railway or through a tunnel or an out-of-bounds area is drawn on the map as a linear object, according to the plan shape.

If underpasses or tunnels etc. are to be used in a competition, they shall be emphasized with symbol *Crossing point (710.1)* or *Crossing section (710.2)*.

Colour: purple (over black).



714 Temporary construction or closed area (A)

Obvious temporary constructions like platforms for spectators and speaker, closed area for spectators, outside restaurant areas, etc. shall be represented in plan shape. A Temporary construction or closed area shall not be entered.

Minimum width: 0.5 mm.

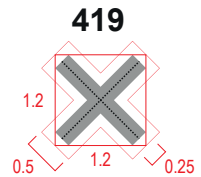
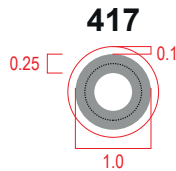
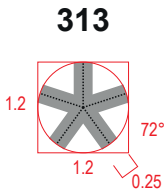
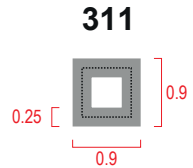
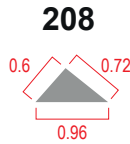
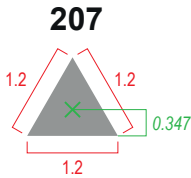
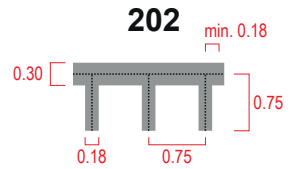
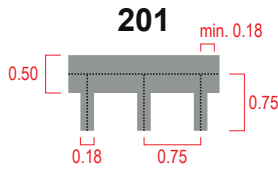
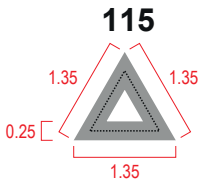
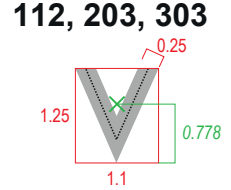
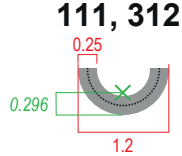
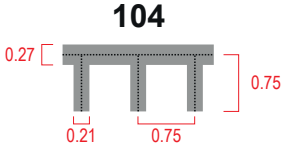
Minimum area: 0.25 mm² (footprint 4 m²).

Colour: purple (outline), purple 50% (over black).

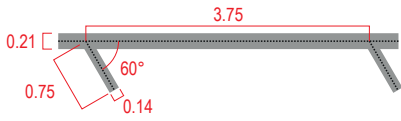
4.8 PRECISE DEFINITION OF SYMBOLS

Note: dimensions are specified in mm.

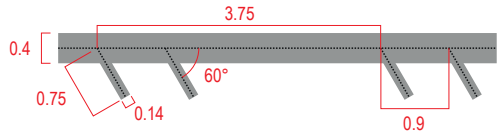
All drawings are magnified (10x) for clarity only. The centre of gravity is marked (x) when it is not unambiguous



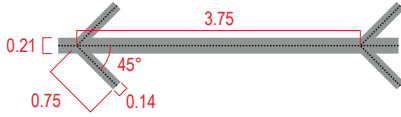
516



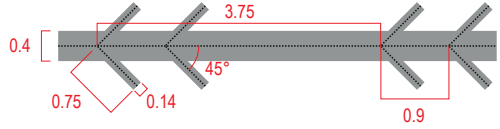
518



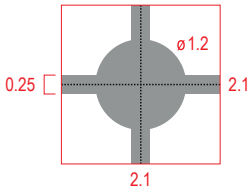
528



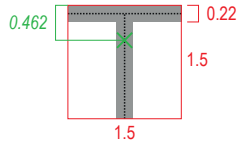
529



524



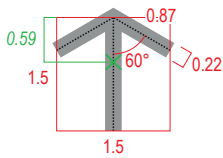
525



526



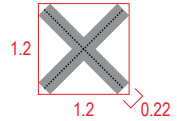
527



530



531





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