WOC 2024 Sprint Course Manual v1.0 12 June 2023

Ten Top Tips for those too busy to read the full document

1. Read the mapping specification and follow it as best you can; inform competitors of any divergences.
2. Map clarity is paramount:
   - simplify and declutter maps as much as possible;
   - ensure legibility of narrow passageways;
   - cut contours at steps and adjust them elsewhere to improve legibility;
   - symbol 520 (olive green) must always have a solid boundary line, but consider using symbol 411 (dark green) for small areas to improve legibility.
3. Don't tempt competitors to cross impassable barriers or take short cuts through out of bounds areas.
4. Use clear and unambiguous control sites and control descriptions.
5. Give course lengths as shortest feasible route, not straight line.
6. Print maps at the correct scale (1:4,000). Provide enlargements for younger and older competitors where possible but never reduce the map scale to fit the page.
7. Work with your printer to ensure colours are correctly printed: make test prints and adjust colour definitions in the OCAD file if necessary.
8. Ensure the course planning symbols are clear:
   - avoid over-complex course shapes and place control numbers carefully;
   - control numbers must use "upper purple" and should have a white outline;
   - cut control circles and leg lines where they might obscure important map details.
9. Prioritise safety of competitors and the general public in course planning: avoid traffic as much as possible and consider marshalling road crossings and entrances from narrow passageways.
10. Use the final details to:
    - remind competitors of the impassable features;
    - explain and illustrate any non-standard symbols;
    - explain and illustrate any particularly complex / multi-level areas or unusual features in the competition area.

Key resources:

ISSprOM 2019-2 Map Specification

IOF Competition Rules

IOF Guidelines for course planning in Foot-O Sprint competitions

IOF Guidelines for mapping and planning in complex urban structures

WOC 2024 Sprint World Orienteering Championships Edinburgh

Scottish Orienteering

Contents

1 Introduction

Scotland is hosting the second Sprint World Orienteering Championship in and around Edinburgh in July 2024.[1] A wide range of racing and training opportunities will be available in the period leading up to WOC 2024, including international competition at Euromeeting 2023, several other high profile races and a number of formal training camps.[2]

This manual is intended to help ensure that the series of high profile sprint events being promoted by WOC in the run-up to the 2024 championships takes a consistent and high quality approach to mapping, planning and staging, improving the experience for domestic and international competitors.

However, the manual should also have much wider utility: whilst some elements (e.g. bibs and marshals) may only be practical at larger events, many of the mapping recommendations and reminders are applicable to all sprint competitions.

The focus of the document is the "on-course" aspects of events: mapping, course planning and map printing. It is not intended as a comprehensive guide to event organisation, or to the event rules of the IOF[3] or British Orienteering.[4]

1.1 Sprint formats[5]

The Sprint World Orienteering Championships currently includes three sprint disciplines:

- Sprint: an individual race using a time trial format;
- Knock-out Sprint: head to head racing through a number of rounds;
- Sprint Relay: mass start, with mixed teams of four athletes.

Detailed specifications for each discipline are contained in the IOF rules. The great majority of events in the UK are individual sprints, and most planners, organisers and competitors are familiar with this format.

Most of this document applies to all formats, but knock-out sprint and sprint relay involve some additional considerations, particularly with respect to safety.

1.2 Sprint "philosophy"

Sprint races are intended to be high-speed; testing athletes' ability to read and translate the map and to plan and carry out route choices running at high speed.

The key challenge is choosing and executing the best route between the controls, not finding them once the athlete is in the circle.

2 Maps

2.1 Specification

The current sprint mapping specification is ISSprOM 2019-2. There have been a number of revisions since ISSprOM[6] was introduced, the current version is Revision 5, dated September 2022.[7] The IOF

[1] https://www.woc2024.org/
[2] https://www.woc2024.org/training/
[3] https://orienteering.sport/orienteering/competition-rules/
[4] https://www.britishorienteering.org.uk/rules
[5] This document uses "sprint" to refer to the WOC disciplines: Sprint (winning time 12-15 minutes), Knock-out Sprint and Sprint Relay; and "urban" to refer to longer events (winning time typically 30-60 minutes) which are often held on sprint-specification maps.
[6] International Specification for Sprint Orienteering Maps
[7] https://orienteering.sport/iof/mapping/

Map Commission has discussed further changes so future revisions can be expected, provisionally coming into effect from 1 January 2024.

One effect of these repeated revisions is that it can be difficult for clubs to keep their maps up to date, and for national federations to ensure that competitors know and understand the current rules. Additionally, the versions of mapping and planning software used may not always have the updated symbol specifications.

Ideally, all maps would be made to the current version of the specification, and for major events this should of course be the case, but for smaller events this is not always possible.

Where an older map is being used, it is important to let competitors know which specification is used, and to highlight any significant divergences.

2.2 Scale

The ISSprOM-2 scale is 1:4,000, with enlargement to 1:3,000 permitted for younger and older age classes. There should usually be no difficulty fitting a sprint course onto a sheet of A4 at this scale.

Many older maps of urban areas in the UK were drawn at 1:5,000 (which was acceptable under ISSOM, the previous sprint specification). This can be helpful for urban races as it allows a larger area of terrain to be shown on a single side of paper.

However, all sprint race maps should be printed at 1:4,000, and ISSprOM (and ISSOM) maps which have been drawn at 1:4,000 must never be reduced to 1:5,000 for printing.

2.3 Minimum dimensions and gaps

ISSprOM 2019-2 has a strong focus on legibility at racing speed. It defines minimum dimensions for many area and line features e.g.

- 406 vegetation: slow running - minimum size 1.0 mm² (footprint 16 m²);
- 516 Passable fence or railing (isolated) - minimum length 2.2 mm (footprint 8.8 m).

It also specifies the minimum permissible gap between features, e.g.

- Gaps between uncrossable features - minimum gap 0.40 mm. (=1.6m);
- Spacing of steps - minimum spacing 0.40mm.

Appendix 1 contains a table of the minimum dimensions of the most commonly-used symbols.

In practice, very few, if any, existing sprint maps are 100% compliant, not least because:

- Many maps were drawn prior to the introduction of some of these minimum dimensions;
- It is very tempting for mappers to include everything they see, which can lead to maps being unduly cluttered;
- Sprint maps have often been made by importing OS MasterMap data and "colouring-in": this is quick and easy but causes various problems, e.g. smaller than permitted gaps between objects when thin lines in the base data are converted to ISSprOM symbols.

It would be very time-consuming to make most current sprint maps fully compliant, however, significant improvements can be made by focussing on decluttering and passability.

2.3.1 Decluttering

Most maps can be considerably improved by removing features which are below the minimum sizes specified by ISSprOM. Such feature are often irrelevant for navigation:

- Small isolated lengths of passable fencing: in reality these aren't "passed over" as competitors typically go around short lengths of fencing rather than climb over;
- Very small blocks of colour and minor vegetation distinctions can often be combined or omitted completely, especially when next to buildings or uncrossable barriers;

- Steps: these should be generalised, there's no need to represent every step;
- Complex or fiddly pavement edges: such edges can be useful to competitors in some circumstances but not at the expense of map legibility.

Street furniture such as benches, litter bins and lampposts should not be mapped. Where they have been included, e.g. in school grounds or parks, where that part of the map is used for school or introductory events, those symbols must be hidden for normal competition use.

2.3.2 Passability

Competitors at racing speed must be able to see whether a particular route is possible: a key element of this is ensuring that the gaps between buildings and other uncrossable features are clearly visible. These gaps must always be at least 0.40mm, and mapping them appropriately often requires significant exaggeration and distortion of surrounding features.

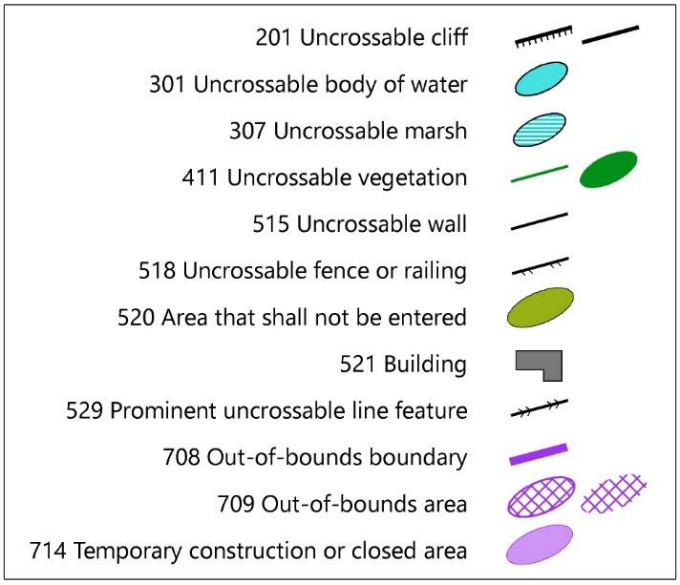
The most recent version of OCAD has a specification checking tool, which can be helpful, but it is not fool-proof and visual checking is still required. One option is to create a new symbol (e.g. an opaque line symbol 0.40mm wide) which can be drawn over passageways. If it touches the buildings on both sides then the passageway needs widening.

2.4 Uncrossable features

Uncrossable features are an important feature of sprint maps, and a variety of out-of-bounds or dangerous areas, forbidden routes, line features that must not be crossed, etc. must be shown on the map.

Although both ISOM[8] and ISSprOM include features named as "uncrossable" (e.g. both specifications include a symbol 301 "Uncrossable body of water"), whether or not competitors are permitted to enter or cross differs between specifications, and is defined by IOF rule 17.2, which has a full list of "forbidden" symbols for each specification.

For sprint maps, competitors must not enter or cross areas or features drawn with the following symbols:



NB symbol 512.1 Bridge or tunnel entrance (discussed in 2.6 below) is only passable at one level.

[8] International Specification for Orienteering Maps (used for "forest" races, e.g. WOC Long, Middle & Relay)

2.4.1 Symbol 411: Uncrossable vegetation

One very significant recent change in the specification is that symbol 411 (dark green) has been reintroduced for uncrossable vegetation, whilst symbol 410 (green 100%) has reverted to its former meaning of "vegetation: fight".

Symbol 410 should be used for areas that are physically difficult to cross: gorse or rhododendron bushes, but areas or features such as hedges that competitors are forbidden to cross must be shown using symbol 411.

2.4.2 Symbol 520: Area that shall not be entered

Symbol 520 (olive green) "area that shall not be entered", is widely used for flower beds as well as private land. Small areas of 520 do not stand out well against 401 "open land" (yellow 100%) and you should consider converting to 411 where there is a risk that competitors will not see the area if drawn with 520.

Areas of 520 must always be delineated by a boundary line of at least 0.1mm. It is permissible to use uncrossable features (walls, fences and hedges) as the boundary line where these are dominant features (i.e. where a competitor will see the wall, but not the private land beyond), but care must be taken that this does not reduce the gap between uncrossable features below 0.4mm.

2.4.3 Taping & marshalling

Uncrossable features that are not obvious to competitors should be marked on the ground: if there are gaps in hedges that competitors might be tempted to run through then consider closing them with barrier tape.

Remember that athletes simplify the terrain when travelling at speed and may not always register small forbidden areas, especially if they are unexpected, e.g. if an area of open grass on the running line is out of bounds you should tape it, even if it is mapped using symbol 520.

If you are using tape in the terrain you should tell competitors in the event details and describe (and if possible illustrate) the tape being used.

If you have areas of particular concern, either for competitor safety or to retain permissions for future events, and an area cannot be avoided by replanning, then consider marshalling.

2.5 Contours

Contour lines are usually relatively less important for navigation in sprint events than those held in forest or upland terrain, and whilst they must still be included, care must be taken that they don't distract from or obscure more valuable details on the map.

Contours must be cut or adapted to not touch various landform features (e.g. knolls and depressions), and must also be cut where they cross stairs (symbol 532).

Care must also be taken that contours do not fill or otherwise obscure narrow gaps between uncrossable features such as walls and hedges.

2.6 Multi-level Structures

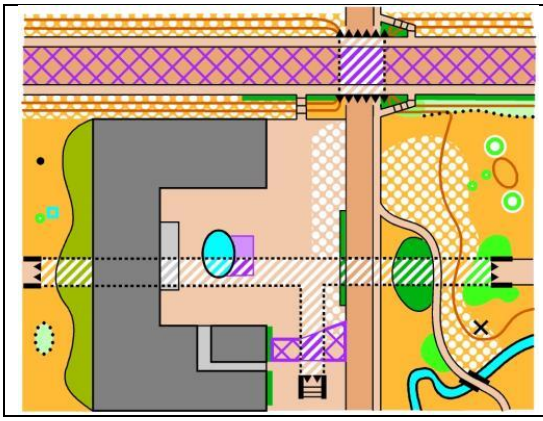
Multi-level areas such as bridges, canopies, underpasses or accessible areas under buildings are common in urban areas and can be very attractive to planners seeking to provide route choice puzzles for competitors. However, representing three-dimensional structures on a two-dimensional map is challenging and great care must be taken to ensure that competitors can understand the map at speed.

ISSprOM allows for the representation of ***simple*** multi-level areas: a maximum of two running levels is allowed. ISSprOM includes three new symbols to map multiple running levels:

- 512.1 "Bridge or tunnel entrance" (black "shark's teeth") which identifies the entrance to the lower level;
- 512.2 "Underpass or tunnel" (black dashed line) which defines the extent of the lower level;
- 512.3 "Area passable at two levels" (diagonal stripes, various colours) which describes the terrain on the upper level. The angle of the stripes should be approximately 45° to the direction of the axis of the described area.

International competitors are likely to be familiar with these symbols, but they may well be new to domestic competitors, and if used they should be explained in the event bulletin / final details. If in doubt, put photos and map extracts in final details.

Be aware that this is still an area of active debate, and it is likely that the guidance and specification will be further revised in future.

	Illustration of mapping of multi-level area, taken from the IOF document "Guidelines for mapping and course planning in complex urban structures on sprint orienteering maps",[9] which provides guidance and examples of the use of these symbols in various scenarios. It seems likely that 50% grey stripes will be introduced in the near future, e.g. for the section of the tunnel that runs underneath the building.

2.7 Optional colours and special symbols

ISSprOM 2019-2 includes colour options for two symbols. WOC 2024 maps will use the following options:

- 301 Uncrossable body of water: blue 70%
- 601 Magnetic north line: blue. NB north lines must be 30mm (=120m) apart.

ISSprOM 2019-2 includes two symbols for prominent man-made features: 530 (o) and 531 (x). WOC 2024 maps will use 531 (x) for play equipment.

2.8 Artificial barriers

Artificial barriers can be used to provide additional challenges in familiar areas or where elite competitors can be expected to have done significant preparation. Where barriers cross public roads or paths you will need to ensure that public access is maintained, unless you have permission to close such routes to all traffic.

If you are using barriers then you must provide a description (preferably with an illustration) in the final details / event bulletin.

Note: this section will be updated following the publication of WOC bulletin 2 in July 2023.

[9] https://orienteering.sport/iof/mapping/

2.9 Non-ISSprOM symbols

Generally these should be avoided, but where any additional symbols are used they should be identified and explained both in the final details and on the map.

In some circumstances, e.g. where sprint maps incorporate significant non-urban terrain, it may be appropriate to use ISOM forest-style symbols for footpaths to enhance visibility, especially if paths coincide with contours: again, this should be explained in final details.

3 Planning

3.1 Course lengths

The length of sprint courses, like those of forest events, is based on estimated winning time. For individual sprint events the permitted range is between 12-15 minutes; planners should aim for the middle of this range, i.e. 13 minutes 30 seconds.

Course lengths must always be given as the shortest route which a competitor could reasonably possibly take, not the straight line distance between controls.

3.2 Course clarity

Map clarity at running speed is essential for fair competition: it's acceptable for a runner to have to stop to work out the best route choice but it's not ok to have to stop to see if a particular route is passable because the map is unclear.

Planners should also avoid over-complex course shapes and course lines that run to the "wrong" circle: deciphering purple spaghetti is not part of the orienteering challenge.

Legs should not contain route choices giving any advantage or disadvantage which cannot be reasonably foreseen from the map by a competitor under competitive conditions.

3.3 Control sites

It should be possible to navigate to the majority of control sites just from the map, the only exception being in multi-level areas.

When a control is sited on one side of an impassable feature the control circle should be offset so that it is clear from the map which side of the feature the control is located.

It should not be possible to punch the control (either physically or in touch-free mode) from the wrong side of an impassable fence, wall or hedge.

Control flags must not be hidden: when competitors reach the control they should not have to search for the flag.

Control descriptions should be unambiguous and as simple as possible: control sites that can't fairly be described shouldn't be used.

3.4 Control site separation

IOF and BOF rules differ on the minimum separation allowed between controls.

For IOF events the minimum running distance between controls is 25 metres and the minimum straight-line distance is 15 metres.

For BOF events the minimum separation of controls is 15m, or 30m if the control sites are on similar features. If the controls are separated by an impassable feature and there is no ambiguity as to their locations then the separation may be reduced provided that the distance measured around the impassable feature still exceeds the 15m/30m limit.

Note that these are minimum distances and larger separations may be necessary where there is a reasonable chance of confusing controls, or if there is any possibility that an athlete's timing chip may still be giving feedback from a previous control when they reach their intended control (regardless of whether the previous control was on their course).

3.5 Forbidden areas

It's very tempting as a planner to set traps for competitors and the suite of impassable features appears to provide opportunities for this, however, courses must be planned to avoid inviting competitors to cross forbidden barriers or enter private or dangerous areas.

There is a high risk that some competitors will try to cross walls/fences/hedges mapped as uncrossable, especially if they don't look too daunting on the ground. Using barrier tape can help remove any perceived or claimed ambiguity.

For major events or where risk of infringement would inhibit future use of the area for orienteering, consider requiring competitors to wear numbered bibs and employing marshals in the competition area.

3.6 Safety

Sprint races in urban terrain present a number of additional hazards compared to typical forest races, arising in particular from vehicle traffic, pedestrians and the higher speed of competitors.

In an ideal world sprint races would take place in an entirely traffic-free environment: unfortunately this is rarely possible. Course planning should seek to avoid busy streets as much as possible: in particular don't tempt athletes to cross potentially dangerous roads. Mark busy areas as out of bounds and if necessary use a marshal to check compliance.

It may also be necessary to use marshals at exits from narrow passageways, alerting spectators of approaching competitors and making sure that competitors are not hindered.

3.6.1 Head to head formats

Head to head racing is exciting, and there is likely to be increased interest in these formats, however, it brings a few additional considerations and requirements, especially with regard to the safety of competitors and members of the public.

- Road crossings: runners in a pack may be less aware of their surroundings and more likely to take risks to stay in touch;
- Packs of runners in narrow alleys cause safety issues for pedestrians and other runners;
- "Dog-leg" controls in confined spaces create a collision risk for runners in packs.

Areas for head-to-head racing need to be carefully selected to minimise these risks.

4 Printing

Sprint maps must always be laser-printed. Whilst offset printing is still preferred for forest maps for major events, it is not possible to correctly print the course planning symbols (especially the control numbers) for sprint events by offset.

Laser printing is also much more practical given the potential need for last minute reprints due to unexpected terrain and/or permission changes.

IOF rules specify a minimum resolution of 150 lines per inch. This is unlikely to be challenging for professional printers but may not be achievable by domestic machines.

4.1 Colours

Getting the colours right is critical for sprint maps: if printing is too dark the course markings won't be visible, and if colours aren't well enough defined competitors won't distinguish yellow from olive-green or light brown.

The IOF provides CMYK definitions for the seven map colours. However, whilst this table should be the starting point for OCAD files, it isn't possible to give a set of fixed colour definitions for laser printing, because each laser printer gives its "own colours".

For major events you should run test prints and work with your printer to ensure that the colours are correct. The IOF has provided a "print test sheet" to adjust the CYMK definition and calibrate specific printers.

4.1.1 Colour table

Maps must have the right colours, and they must also be "in the right order", to ensure that important information is not obscured when features coincide. The colour table, which determines colour order, is found under the "map" menu in OCAD.

Appendix 2 matches ISSprOM symbols with the various colours. There are multiple instances of each colour in the table: typically point symbols of a given colour use a different, and higher, version of a colour than area symbols.

Key points to note:

- The distinction between upper and lower purple, allowing correct depiction of course planning symbols;
- The distinction between the dark green for linear hedges and the dark green for areas of uncrossable vegetation (symbol 411);
- The correct position of brown 100%, which places contours below blue point and line symbols, black building outlines and dark green hedges.

4.1.2 Course planning symbols

Showing the course planning symbols clearly, and in particular the control numbers, is a priority for sprint events: all competitors will be familiar with the struggle to work out which control is next.

Control numbers must use the upper purple – nothing should be visible underneath the numbers – preferably with a white outline. If planning in Condes, you should uncheck the "use overprint for control numbers" box.[10]

It's crucial that course markings (lines, circles and control numbers) don't obscure important map details. Circle and lines must be cut where they could confuse competitors, and great care should be taken with the placement of control numbers. Remember that competitors don't always take the optimum route between controls!

5 Event Information

For major events there are detailed rules as to the information that should be provided to competitors and the formats in which it should be presented.

For all events the event website and final details should include:

- Map scale and contour interval;
- Map specification and date of most recent updates;

[10] Canvas>Course Overprint Symbols and Dimensions – Overprint Colors tab

- Explanation of any major divergences from the specification;
- An illustration of all uncrossable features should be provided;
- Explanation of any special symbols used;
- Illustration of artificial barriers if used;
- Explanation and illustration of taping if used;
- Course distances given as shortest feasible distance;
- Timing system, and if contactless systems, whether the start and finish must be punched;
- Warning of any hazards: busy areas for traffic, pedestrians, rivers and canals, etc;
- If there are any particularly complex (e.g. multi-level) areas then these should be illustrated or explained;
- Link to most recent version of map (either as jpg file or via Routegadget) if the area has been used for competition before.

Appendix 1: ISSprOM 2019-2 v5 minimum dimensions

Minimum gaps	**mm**
Gaps between uncrossable features	0.40
Gaps between line features of the same colour	0.15
Opening of fences, hedges, walls	1.00
Spacing of steps	0.40
Minimum widths / areas	**mm/mm2 (m2)**
401 Open land	0.30 / 0.50 (8m2)
402 Open land with scattered trees	2.20 / 6.25 (100m2)
403 Rough open land	0.40 / 1.00 (16m2)
404 Rough open land with scattered trees	2.50 / 6.25 (100m2)
406 Vegetation: Slow running	0.40 / 1.00 (16m2)
408 Vegetation: walk	0.40 / 0.50 (8m2)
410 Vegetation: fight	0.25 / 0.30 (5m2)
411 Uncrossable vegetation	0.40 / 0.30 (5m2)
501.3 Paved area with scattered trees	2.20 / 6.25 (100m2)
520 Area that shall not be entered	0.25 / 0.25 (4m2)
521 Building	0.50 / 0.25 (4m2)
522 Canopy	0.50 / 0.25 (4m2)
Minimum lengths	**mm (m)**
201 Uncrossable cliff	1.10 (4.4m)
202 Passable rock face	1.10 (4.4m)
513.1 Passable wall	1.40 (5.6m)
513.2 Passable retaining wall	2.40 (9.6m)
515 Uncrossable wall	1.00 (4m)
516 Passable fence or railing	2.20 (8.8m)
518 Uncrossable fence or railing	3.00 (12m)
528 Prominent line feature	2.20 (8.8m)
529 Prominent uncrossable line feature	3.00 (12m)

Note the minimum lengths for fences and walls are for "isolated" examples – a shorter length of wall closing a passage between buildings is permissible

This table includes minimum dimensions for the most commonly used symbols but is not a comprehensive guide to all ISSprOM 2019-2 symbols.

Appendix 2: ISSprOM 2019-2 v5 Symbols and the Colour Table

Colour name	Symbols	C	M	Y	K
Upper purple for course overprint	512.3, 702, 704, 707, 709, 710.2	35	85	0	0
White for course overprint	704 (outline)	0	0	0	0
Purple 50% area symbol	714	18	43	0	0
White for railroad	509.1	0	0	0	0
Black 100%	201, 202, 203, 204, 205, 206, 207, 208, 210, 301 (outline), 307 (outline), 415, 416, 501.1, 501.2, 505 (outline), 506, 507, 508, 509.1, 510, 511, 512.1, 512.2, 513.1, 513.2, 515, 516, 518, 519, 512 (outline), 522 (outline), 522.1, 524, 525, 526, 527, 528, 529, 530, 531, 532, 601*	0	0	0	100
Green 100% point symbols	417, 418, 419	76	0	91	0
Lower purple for course overprint	701, 703, 705, 706, 708, 710.1	35	85	0	0
Dark green line symbols	411 (linear hedge)	100	0	80	30
Blue 100% point and line symbols	302 (outline), 303, 305, 306, 309, 311, 312, 313, 601*	100	0	0	0
Brown 100%	101, 102, 103, 104, 105, 107 ,108, 109, 110, 111, 112, 113, 115	0	56	100	18
White stripes for area passable at two levels	512.3	0	0	0	0
Brown 50% for road infill	See note 1 below	0	28	50	9
Brown 30% for road infill	See note 1 below	0	17	30	5
Black 100% for road outline	See note 1 below	0	0	0	100
Black 50% for large buildings and tramway	509.2, 521	0	0	0	50
Black 20% for canopy	512.3, 522	0	0	0	20
Blue 100% area symbols	301*, 307, 308, 310, 512.3*	100	0	0	0
Blue 70% area symbols	301*, 512.3*	70	0	0	0
Blue 50% area symbols	?	50	0	0	0
Blue 30% area symbols	302, 512.3	30	0	0	0
White over green and brown	406 (lines) 408 (lines), 410 (lines), 417, 418, 419, 501.3 (dots)	0	0	0	0
Brown 50% for paved area	501(heavy traffic), 512.3	0	28	50	9
Brown 30% for paved area	501(light traffic), 501.3, 505, 512.3	0	17	30	5

Yellow 100% + Green 50%	512.3, 520	38	27	100	0
Dark green area symbols	411(area), 512.3	100	0	80	30
Green 100% area symbols	407, 409, 410, 413 (dots), 414 (lines), 512.3	76	0	91	0
Green 60% area symbols	402 (dots), 404 (dots), 408, 410 (lines), 512.3	46	0	55	0
Green 30% area symbols	406, 408 (lines), 410 (lines), 512.3	24	0	27	0
Black 30% area symbols	214, 512.3	0	0	0	30
White over Yellow	402 (dots), 404 (dots)	0	0	0	0
Black for cultivated land and sandy ground	213 (dots), 412 (dots)	0	0	0	100
Yellow 100% area symbols	401, 402, 413, 414	0	27	79	0
Yellow 50% area symbols	213, 403, 404, 413, 414	0	14	40	0

* Two symbols have alternative colours:
- 301 Uncrossable body of water can use blue 100% or blue 70%;
- 601 Magnetic north line can be black or blue.

You should only use one of the alternatives on a particular map.

Note 1: there is no specific ISSprOM symbol for roads. These colours are provided to allow a bespoke symbol to be defined in mapping programmes to allow easy drawing of intersections and junctions (because the infill is above the outline in the colour table). However, care must be taken with the placement of contours, as these will overlay the road edge. Note that the infill will also obscure canopies and tramways and in most circumstances it will be preferable to use the "paved area" options.

Remember that while the colour definitions in the table above can be used initially in your mapping software, each laser printer renders colour individually, and must be adjusted, ideally using the IOF print test sheet.