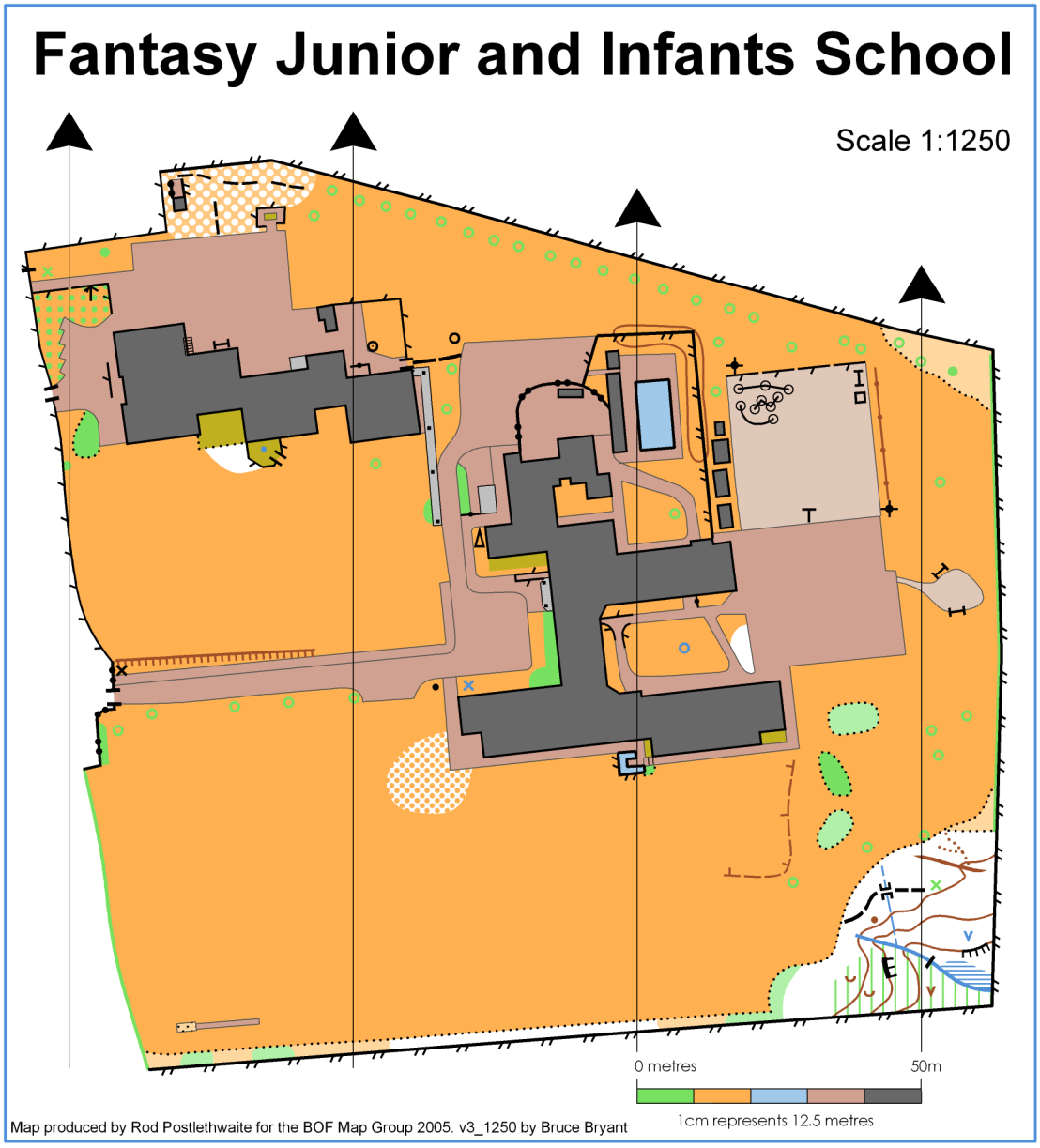
British Orienteering Federation
Specifications for
School Orienteering Maps



Covering

- Drawing specifications
- Guidance on map production for schools

Contents

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Printing by alan@print5.co.uk

Orienteering Maps for Schools

The purpose of this document is to provide both experienced orienteering mappers with a standard specification and to provide guidance to a wider school audience on how to prepare orienteering maps of schools. This project is a co-development by the BOF Development Team and Mapping Group.

1. Introduction

School orienteering maps differ from competition orienteering maps partly because of the larger scale and partly because of the other uses in schools. School maps are usually at a large scale with buildings and paths drawn in plan position and objects shown diagrammatically. School sites also predominantly consist of man-made features with a range of detail (posts, seats, playground equipment, etc.) not found on competition maps.

There are a number of reasons why the mapping of schools requires a modified approach compared to that used for the depiction of the 'classic' forested terrain or urban sprint areas. These include:

- School areas are usually a mixture of paved and open areas that permit visible navigation. Therefore, the amount of detail shown is very important.
- Teaching orienteering at schools requires the use of large scales within a range of 1:250 - 1:4000. Maps of large school sites at scales above 1:4,000 should use the International Specifications for Orienteering maps. (ISOM 2000).

Many more restrictions affecting route choice have to be considered in school areas, such as areas and boundaries with forbidden access.

2. Content of School Orienteering Maps

Schools mapping requires a higher level of detail than standard and sprint orienteering maps. Playground furniture, wastebaskets, individual posts, light poles, etc. certainly fall into this category. A single bench seat is a significant object to a child and these types of objects can be used for control sites, orientation and navigation. However care should be taken not to clutter the map with too many objects.

In school sites, passages, gaps in walls, gates, fences, hedges and other openings are very important for route finding.

From a cartographic point view, an exaggeration of 2 or 3 times the original size of a feature is acceptable.

Generally only permanent objects obvious to children should be mapped.

3. Basic Elements

3.1 Format of the map

- The aim should be to produce a map at A4 format orientated to magnetic north.
- All the required elements are set out in Appendix A.

3.2 Scale and contours

A scale should be chosen that enables the map to fit onto an A4 page. However the scale should generally be a 'rounded' metric figure, for example 1:500, 1:1,000, 1:2,500. A written description of the scale (i.e. 1cm on the map represents 5, 10, 25 metres on the ground) should be included.
Contours should not generally be used on Primary school sites, use the earth bank symbol to indicate abrupt changes in level. Contours should be used on secondary sites as required.

3.3 Colour Concept

The 6-color concept of ISOM2000 should be adopted for school orienteering maps. Thus, the colour combinations of black, brown, yellow, blue and green are possible, and purple for course details.

Specially prepared black/greyscale maps can also be useful to schools as colour masters do not make good B/W copies.

3.4 Symbol Size

The symbol dimensions for school maps are enlarged from the standard ISOM2000. Maps with a scale of up to 1:2,000 should use the standard school symbol set, which is 200% enlarged symbols, map scale 1:2,000 - 1:4,000 should use the reduced symbols set which is 150% enlargement.

4. Principles

The prime function of an orienteering school map is to teach the basic skills of orienteering together with map reading and navigation.
These specifications have been primarily based on ISOM2000. Additional symbols have been introduced for appropriate detail at the larger scales used for school maps.

5. Printing

School orienteering maps should be produced to fit A4 paper.

The aim should to produce printed copies where the detail matches this specification and the colours match the ISOM 2000 colour set. Colour swatches are available from BOF office or your local club.
Orienteering maps need to be printed in colour to easily differentiate between the many symbols. Therefore colour maps should never be photocopied in black and white. The final map can be delivered in the following formats:

- Litho printed maps.
- Colour master for photocopying.
- OCAD file with copy of OCAD version 6.
- PDF format file (Acrobat).

The mapper should liaise with the school to identify the most appropriate format agreeable to all parties and consult about the number of copies required.

It may be possible for experienced mappers to produce simplified black and white\grey scale masters for photocopying based on these specifications with limited modification.

6. Definition of Symbols

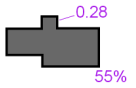
These symbols are available as OCAD symbol sets in both the "Standard" (200%) and "Reduced" (150%) sizes.
Symbol sets are available for download from the BOF Map Group web site – See Appendix D

6.1 Man-made Features	(black + grey)
6.2 Vegetation	(green + yellow)
6.3 Land Forms	(brown)
6.4 Water Features	(blue)
6.5 Rock and Boulders	(black + grey)
6.6 Technical Symbols	(black + blue)

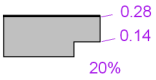
v	gap or infill between two lines
—	line thickness
ı ı	distance from centre to centre or length of line
ø	diameter

Note: dimensions are specified in mm at the "Standard" scale (200%).
All drawings are to scale.

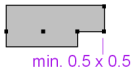
6.1 Man-made Features



Building (S101)
A building is a relatively permanent construction having a roof.
Colour: black, black 55%.



Canopy (S102)
A canopy is a building construction (with a roof), normally supported by pillars, poles or walls, such as passages, gangways, courts or bicycle sheds. At least one side of the structure is without a closed front. The open edges are shown with line thickness 0.14 mm and closed edges with 0.28 mm.
Colour: black, black 20%.

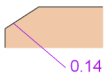


Pillar (S103)
A pillar is an upright shaft or structure, of stone, brick or other material, relatively slender in proportion to its height and any shape in section, used as a building support.
Colour: black.

Out of Bounds Area (S104)
An out of bounds area such as a private area or a flowerbed. Within this area only prominent features should be shown; such as paths, large buildings, large trees and ponds.
Colour: yellow 100%, green 50%.

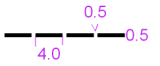
Hard paved area (S105)
A hard paved area is an area with firm level surfaces such as asphalt, slabs, concrete or the like. Distinct differences in the pavement can be represented with the edge of paved areas (S107). The difference between traffic and non-traffic areas shall not be defined.
Colour: brown 50%.

Soft paved area (S106)
A soft paved area is an area with a level surface such as gravel, bark chippings or the like. Distinct differences in the pavement can be represented with the symbol step or edge of paved areas (S107).
Colour: brown 30%.

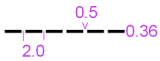


Edge of paved areas (S107)
An edge of a pavement.
Colour: Black 65%.

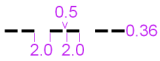
Step (S108)
Steps of a stairway should be represented in a generalised manner.
Colour: Black 65%



Footpath (S109)
A large path, or old vehicle track, which is distinct on the ground.
Colour: black.

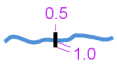


Small path (S110)
A small path.
Colour: black.

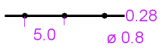


Less distinct small path (S111)
A less distinct small path.
Colour: black.

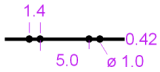
Footbridge (S112)
A bridge is a structure spanning and permitting passage over a stream, road or the like.
Colour: black.



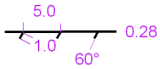
Small footbridge (S113)
A footbridge with no path leading to it.
Colour: black.



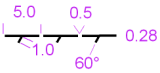
Wall (S114)
A stone or brick wall or stone faced bank. If such a wall is higher than about 1.5 m, it must be represented with the symbol high wall (S115).
Colour: black.



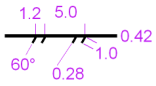
High wall (S115)
A stone wall higher than about 1.5 m, not crossable by the average competitor.
Colour: black.



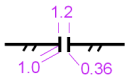
Fence (S116)
A passable fence is usually made of posts and wire or wood. It is used to prevent entrance or to confine or mark a boundary. If a passable fence is higher than 1.5 m it must be represented with the symbol high fence (S118).
Colour: black



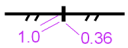
Low fence (S117)
A passable fence less than 0.5 m in height.
Colour: black



High fence (S118)
An impassable fence or railing, which may not be passed, due to forbidden access or because it may constitute a danger to the competitors because of its height.
Colour: black.

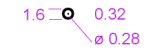
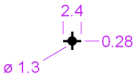
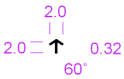
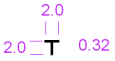
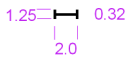
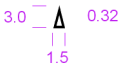
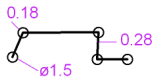


Crossing point – Gate (S119)
All ways through or over fences or walls should be indicated.
Colour: black.



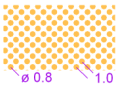
Crossing point – Stile (S120)
A way over a fence or wall for pedestrians only.
Colour: black.

Special symbols for man-made features (S121 – S130)
There are a limited number of symbols available for the wide variety of features found in schools.
The following table shows suitable combinations but can be interpreted freely and symbols interchanged.
Always name the feature in the map legend.

	Post, bollard, light.
	Flagpole, chimney,
	Tower, floodlight, pylon.
	Sign, notice board, basketball / netball net.
	Bin, plant container, tank, junction box.
	Bird-table.
	Drain cover (map these only where there is a dearth of other features).
	Seat, bench, picnic table
	Sculpture
	Play equipment, bicycle racks, goal posts, cricket nets.

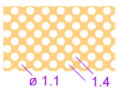
6.2 Vegetation

Open land (S201)
An area of mown lawn, field, meadow, grassland, etc. without trees.
Colour: yellow.



Open land with scattered trees (S202)
An area of meadow with scattered trees or bushes, with grass or similar ground cover. Individual trees (S211, S212) may be added.
Colour: yellow (20 lines/cm).

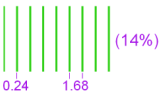
Rough open land (S203)
Areas of generally open land with rough ground vegetation, e.g. heather or unmown grass. This symbol may be combined with the undergrowth symbol (S207) to show reduced runnability.
Colour: yellow 50% (min. 60 lines/cm).



Rough open land with scattered trees (S204)
Where there are scattered trees in rough open land, areas of white (or green) should appear in the tone. Individual trees (S211, S212) may be added.
Colour: yellow 70% (min. 60 lines/cm), white 48.5% (14.3 lines/cm).

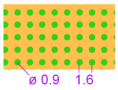
Woodland: easy running (S205)
An area of typical open runnable woodland.
Colour: white.

Woodland: slow running (S206)
An area with dense trees (low visibility) that reduces running to ca. 60-80% of normal speed.
Colour: green 50% (min. 60 lines/cm).

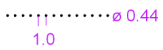


Undergrowth (S207)
An area of dense undergrowth but otherwise good visibility (brambles, heather, low bushes, cut branches, etc.). This symbol may not be combined with the symbol woodland: slow running (S206).
Colour: green.

Vegetation: dense (S208)
An area of dense vegetation (trees or undergrowth) that is barely passable.
Hedges are shown with a single line.
Colour: green 100%



Orchard (S209)
Land planted with fruit trees or bushes. The dot lines may be orientated to represent the direction of planting.
Colour: green, yellow.



Distinct vegetation boundary (S210)
A very distinct vegetation boundary. For indistinct boundaries, the area edges are shown only by the change in colour and/or dot screen.
Colour: black.

Single large tree (S211)
A single large tree.
Colour: green.

Bush or small tree (S212)
A single bush or a small tree.
Colour: green.

Prominent vegetation features (S213)
A special vegetation feature such as a tree stump. The definition of the symbol must always be given in the map legend.
Colour: green.

6.3 Land Forms

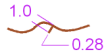
Contours should not generally be used in primary schools.
Consider using the earth bank symbol (S304).

Contour (S301)

A line joining points of equal height. The vertical interval between contours should be either 5 or 2.5 metres.
Colour: brown.

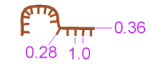
Form line (S302)

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 adjacent contours.
Colour: brown



Slope line (S303)

Slope lines may be drawn on the downhill side of a contour line, e.g. along the line of a re-entrant or in a depression. Slope lines are only used where it is necessary to clarify the direction of slope
Colour: brown.



Earth bank (S304)

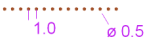
A steep earth bank is an abrupt change in ground level that can be clearly distinguished from its surroundings, e.g. sand pits and embankments. The tags should show the full extent of the slope. Impassable banks must be drawn with the symbol impassable cliff (S501).
Colour: brown.

Small earth wall (S305)

A small distinct earth wall, usually man made. The minimum height is 0.5 m. Due to the large scale; large earth walls should be represented with the symbols contour line (S301), form line (S302) or earth bank (S304).
Colour: brown.

Gully or trench (S306)

An erosion gully or trench that is too small to be represented with the symbol earth bank (S304), contour line (S301) or form line (S302) will be represented by a single line. The line width reflects the size of the gully. The end of the line is pointed. Minimum depth is 1m. Minimum length is 6 mm on the map.
Colour: brown.



Small gully (S307)

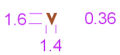
A small erosion gully or trench.
Colour: brown.

Small knoll (S308)

A small obvious mound of earth or rock.
Colour: brown.

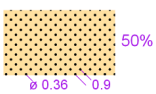
Small depression (S309)

A small shallow natural depression or hollow is represented by a semicircle. Location is at the centre of gravity of the symbol, which is orientated to north.
Colour: brown.



Pit or hole (S310)

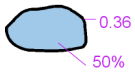
A pit or hole with distinct steep sides. Location is at the centre of gravity of the symbol, which is orientated to north.
Colour: brown.



Open sandy ground (S311)

An area of soft sandy ground with no vegetation, typically a long jump pit.
Colour: black 12.5% (22 lines/cm) and yellow 50%.

6.4 Water Features



Area of water (S401)
An area of water such as a large pond, river or large fountain.
Colour: blue 50%, black.

Pond (S402)
A small area of water (less than 1 mm on the printed map), the bank line is omitted.
Colour: blue.

Small watercourse (S403)
A natural or man-made watercourse. The width of watercourses over 3 m wide should be shown to scale using S401.
Colour: blue.

Wet pit (S404)
A water-filled pit or an area of water that is too small to be shown to scale. Location is the centre of gravity of the symbol, which is orientated to north.
Colour: blue.

Minor water channel (S405)
A natural or man-made water channel that may contain water intermittently.
Colour: blue.

Marsh (S406)
A marsh, usually with a distinct edge. The symbol should be combined with vegetation symbols to show woodland or open.
Colour: blue.

Small fountain or well (S407)
Small fountain or well.
Colour: blue

Other water feature (S408)
A small water feature that is very significant or prominent. The definition of the symbol must always be given in the map legend.
Colour: blue.

6.5 Rock and Boulders

Impassable cliff (S501)
An impassable cliff, high retaining wall or impassable earth bank. The tags may be omitted if space is limited.
Colour: black

Passable rock face (S502)
A small vertical rock face. The tags may be omitted if space is limited.
Colour: black.

Boulder (S503)
A small distinct boulder or rock.
Colour: black.

6.6 Technical Symbols *(Note this symbol is not enlarged from ISOM2000)*

Magnetic north line (S601)
North lines should be added to the map pointing to magnetic north.
At the scale of 1:2 000, the line spacing on the map should be 25mm, (representing 50m on the ground).
For maps with other scales, line spacing should be at an interval that represents a round number of metres (e.g. 20, 25, 50 or 100 m) and should be between 20mm and 40mm on the map. North lines may be broken where they obscure small features. In areas with very few water features, blue lines may be used.
Colour: black (blue).

Appendix A – Survey & Drawing Guidance

Etiquette: Always contact the school beforehand to establish the area to be mapped and arrange a suitable time to survey.

Base maps: Obtain an OS Superplan plot at a suitable scale or OS Siteplan plot available at 1:500, 1:1,250 or 1:2,500. OS maps are available from the local authority for state schools. Ask for the LEA licence number, which should be shown on the map.

Setting up OCAD: Decide the map scale, (to fit an A4 sheet of paper). Open a new file and select the BOF School Symbol set [File…New…]. Set the map scale [Options…Scale…Map Scale]. Bring the scanned map into OCAD as a template [Template…Open…], align the template to fit the OCAD grid and draw in the detail. Then rotate the map by the required amount for Magnetic North. Use the Magnetic North information on the latest 1:25,000 or 1:50,000 OS map. Produce an OCAD map using relevant detail from the base.

The map can then be printed and used for the survey. It may be easier to use an enlarged copy but this should not be more than twice the expected final map scale.

Survey: Relative positioning is important. Map as much as possible for control sites to assist navigation, but don't map too much detail if it makes the map difficult to read.

Do not show features outside the school grounds unless they are public (however external fence junctions are useful for control sites).

The following should be included as standard on all school maps:

- School Name (& logo if school request it)
- Written Scale and Scale Bar, Magnetic North arrow(s)
- Contour Interval (if used)
- OS Grid Reference
- Legend of all symbols used on the map. Aim to use one symbol per line for primary children and language they will understand
- Surveyor's and Cartographer's details
- Registration details see Appendix B
- If possible also include details for the local orienteering club. (web site, etc)

Appendix B – Registration and Copyright Issues

All maps should be registered with a MR1 (SC) form available from BOF. If you are not earning more than £5000 per year from mapping, this will also provide your insurance to survey etc. Once the map is completed please send an electronic copy of the file to BOF office.

Where an Ordnance Survey base has been used the following statement should be added to the map:

Based upon the Ordnance Survey mapping with the permission of the Controller of Her Majesty's Stationery Office. © Crown Copyright. Licence No. ……:

- State schools - use the LA licence number.
- Independent schools - must have their own OS licence number. If they don't already have one they can register for their own licence number with OS, (at no cost)

Copyright for the map would normally be to the school concerned.
Ownership of the artwork legally stays with the mapper, but you may wish to discuss with the school how they maybe able to use the OCAD file to produce copies and overprint courses.

Appendix C – Mapping Contracts

Advice on the procurement of orienteering maps can be found at www.bsoa.org

or on the BOF Map Group web site (see below)

Appendix D – Mapping Downloads

OCAD symbol sets are available for OCAD 6, 7, 8 and 9

These OCAD symbol sets and the latest electronic (pdf) version of this file can be downloaded from the BOF Map Group web site:

www.britishorienteering.org.uk/asp/makepage.asp?PID=MAPPING

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British Orienteering Federation

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Website: www.britishorienteering.org.uk

British Schools Orienteering Association

Website: www.bsoa.org