



**INTERNATIONAL ORIENTEERING FEDERATION  
TRAIL ORIENTEERING COMMISSION**

**TECHNICAL NOTE 11/01 (Guideline revision)**

**BETWEEN**

The 'Between' control in foot orienteering is simple enough but, in trail orienteering, it can be much more complicated. It has developed into a different form from that used in foot orienteering and there is considerable variation worldwide in setting 'between' controls, giving rise to much discussion about the limits of acceptability of such problems. This guideline analyses the difficulties and concludes that additions to the guidelines are necessary to re-define the meaning of the 'between' description.

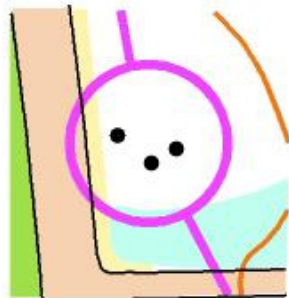
In the present elite guidelines the 'between' definition is as follows:

***The 'between' description refers to the mid-point of the shortest line between the edges of the described features, not the centres.***

This is a clear straightforward definition but there are difficulties. Problems arise in identifying which features the description refers to in elite controls with multiple features.

**1. The 'traditional' form of 'between' description**

Let's begin with the International Specification for Control Descriptions 2004 and an example of a multiple 'between' control from the model event at WTOC 2004.



A	B	C	D	E	F	G	H
6	A-D	↑	▲	▲		≡	

We can see from the map where the centre of the circle is relative to the three boulders. But what exactly does the description tell us? According to the International Specification, Column C describes which **pair** of the features in Columns D and E **within the circle** defines the control.

Having, in this case, identified the northern pair of boulders, the control is positioned, according to Column G, at the mid-point between them. This is very clear.

So there appears to be no difficulty here with descriptions which are consistent with the International Specifications but, before moving on, it is useful to note the difference between foot and trail orienteering in use of the 'between' control. In foot orienteering such a flag placement is between two features that are close together and the flag placement need not be precise. If this group of boulders were used in foot orienteering, the pair selected for a 'between' control would be the two to the SE,

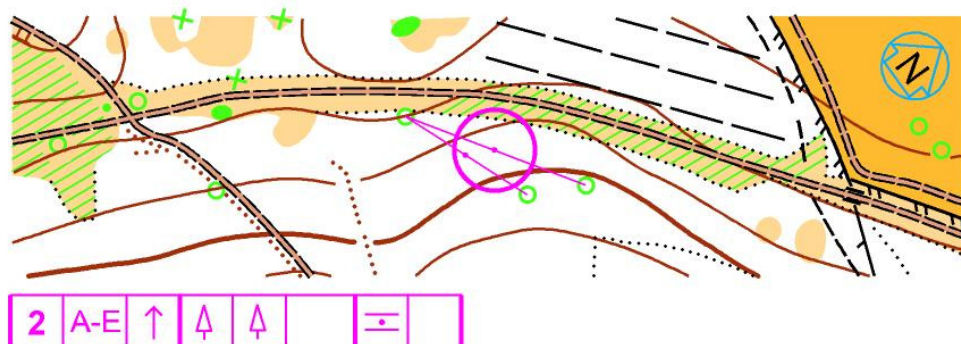
which are close together, not the much more widely spaced N pair. Trail orienteering, on the other hand, can accept wide spacing and the flag placement is precise.

## 2. An alternative form of 'between' description

The use of wider spacing for 'between' controls in trail orienteering has resulted in an alternative interpretation of the 'between' description, used by some planners in trail orienteering.

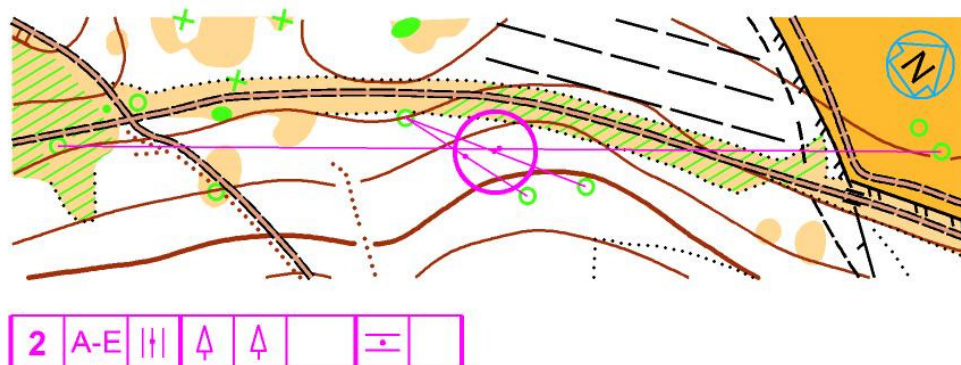
This is that Column C refers not to Columns D and E but to Columns D, E **and** G combined. In other words, Column C refers to the between points themselves, not to the features that the points are between!

This interpretation leads to the possibility in which the features in Columns D and E do not have to be within the circle. There have been many examples of this in recent WTOC and other major competitions. Here is an example from the UK:



There are no distinctive trees within the circle but three nearby. Looking at the geometry shows that the **NW** pair of trees lies on the extrapolated diameter of the circle and their mid-point is the centre of the circle. However, the mid-point of the **SE** pair of trees also lies within the circle, so the Column C description has to identify the **N** of these two. Things are starting to be complicated, but it gets worse!

Once you start accepting features outside the circle, where do you stop? In this UK example, just by amazing chance, there is yet another 'between' point in the circle:



Notice that the description now has to change to the **middle** between point! You could argue that this is a very extreme case, not at all common sense, and you would be right, but it does illustrate the inherent unsatisfactory nature of this interpretation.

The problem of having control features outside the circle is that it is very different from foot orienteering practice. It goes against the well-established principle that we need to stay as close to foot orienteering practice as possible. If there is

considerable advantage to be gained in departing from foot orienteering practice, then it might be worth doing so. However, although some interesting problems can be set with between features outside the control circle, it is difficult to argue they are more important than keeping to established descriptions.

Therefore, it is concluded that 'between' controls in trail orienteering should conform to the 'traditional' descriptions used in foot orienteering.

### **3. Summary**

The following additions to the **guidelines** are made with respect to 'between' controls:

- **Only features within or partly within the circle should be used for setting problems using the 'between' description.**
- **The Column C direction description should identify which two features of several within the control circle form the 'between' pair.**

Brian-Henry Parker  
IOF Trail Orienteering Commission  
February 2011



**INTERNATIONAL ORIENTEERING FEDERATION  
TRAIL ORIENTEERING COMMISSION**

**TECHNICAL NOTE 12/01 (Rules Interpretation)**

**The 'A' Cluster**

It is now common practice in elite competition to have the single marker problem (answer A or Zero), identified in Column B of the description with just the single letter 'A'. Such controls have already been used in WTOCs.

The early use of the single 'A' control had only one marker visible from the viewing point.

Elite trail orienteering has moved on from this requirement. The elite competitor is expected to be experienced and skillful enough to be able to identify the circled and described feature in the terrain to determine whether there is a marker in the correct position or not, without being excessively distracted by other markers, which might be visible from the viewing point.

Note that, with 'A' controls, it is not necessary to lay tapes in the terrain. Tapes are only needed with 'A-B, A-C, etc. controls in the presence of other markers, so that the markers for the control being analyzed can be identified in the sequence A, B, C, etc.

We now have the possibility of the 'A' Cluster for elite competition. This is a group of visible markers, which are single marker problems (A or Z).

For IOF competitions the following procedures are recommended:

- For each 'A' control there is only one flag, which is either correctly placed at the feature (A) or incorrectly placed at the feature (Z) or placed on a similar feature nearby (Z).
- It is permissible for markers from other 'A' or 'conventional' multi-marker controls to be visible from the 'A' control viewing point. Equally, 'A' control markers may be visible from conventional control (eg. A-C) viewing points and these can be part of the problems from those points, unless taped off.
- For any 'A' control, flags other than the 'A' control flag may be positioned within the 'A' control circle, but must not be on features similar to the control feature. This is best explained by example. See the appendix.
- For any 'A' control it is required that the associated flag is clearly visible from the viewing point. It may be necessary to sight the feature and flag from secondary viewing points to determine whether the marker is correctly positioned or not. For zero answers the displacement of the marker has to be substantial enough for a clear answer.

The reasoning behind these recommendations is that the traditional understanding of trail orienteering is of a group of flags at a control being on similar features and identified A-D (for example). For the same group of flags to be used as a single 'A' control is thought by many to be both confusing and undesirable. Although some federations are using multiple flag groups for a single 'A' control, it is considered not proper for IOF competition to include such examples at this time, when there is unfamiliarity and significant opposition to them.

## Interpretation of the Rules

The IOF TrailO Commission has approved the use of 'A' controls, either single or in a cluster, in IOF competitions.

The Commission has also considered whether any change to the Rules is required for the 'A' control concept. The conclusion was that, in principle, the Rules do not prohibit this approach and need not be changed at this time; provided interpretations are explained and recommended procedures are understood.

It is, however, recognized that the Rules would benefit from revision to update them and reduce the need for interpretation. A major revision is scheduled for all IOF disciplines in 2013.

The existing rule on control marker designation in Section 20 'Control set-up and equipment' reads:

**20.6 Control markers are designated from left to right, regardless of depth of view, 'A', 'B'...'E' from a decision point. The decision as to which marker is which is made from this point.**

### **Interpretation:**

The number of control markers associated with the control point is given in Column B of the description:

- If a single marker is indicated (the letter 'A'), only one marker is to be considered, even if several markers are visible from the viewing point;
- If more than one marker is indicated (the letters 'A-B', 'A-C', etc.), then the described number is to be considered, designated as in the Rule. If markers additional to these are visible from the viewing point, tapes or other means should be used to exclude them.

It has been agreed that, if the 'A' cluster is to be used in any IOF competition, written information (such as this note or technical guideline) and practical demonstration in the Model shall be made available to team managers and competitors.

It is emphasized that use of the 'A' cluster, or any other problem setting technique, has to be approved by the Event Adviser to ensure fairness.

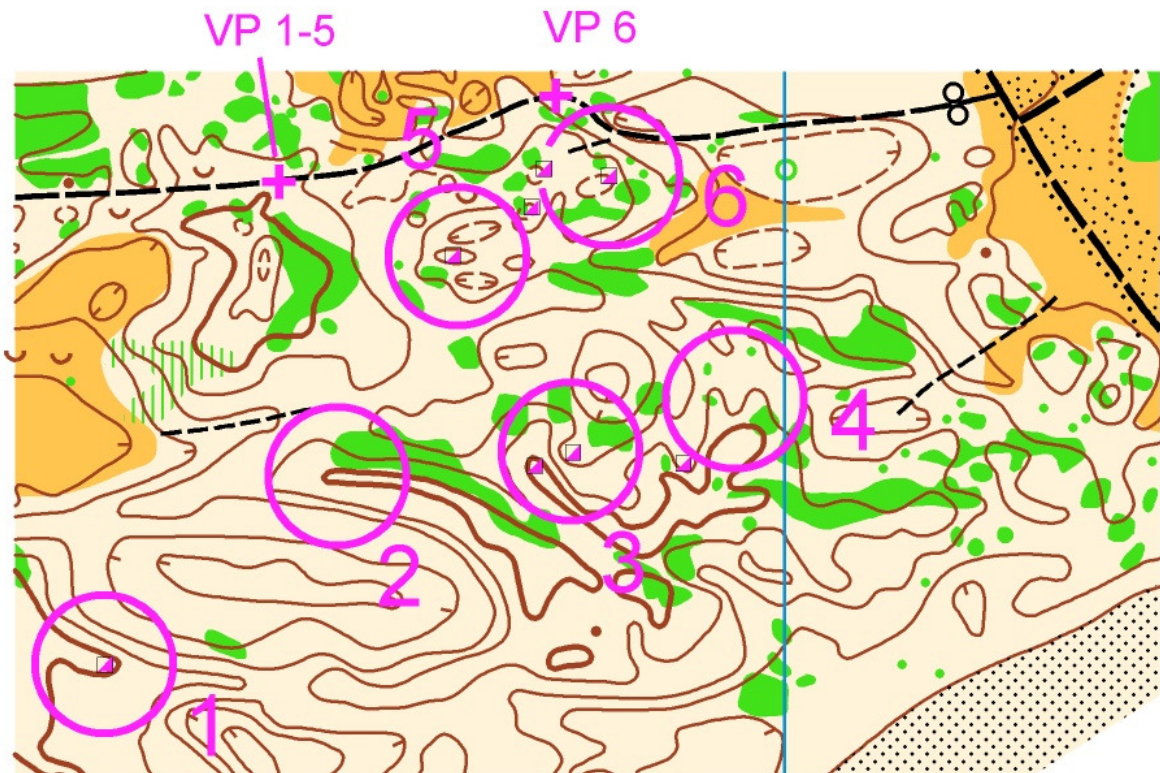
### **Note**

These recommendations are for IOF events, such as world and regional championships. Federations may have different procedures for their own competitions, as they see fit.

Brian-Henry Parker  
IOF Trail Orienteering Commission  
February 2012

## Appendix

### Example of 'A' cluster acceptable for IOF competition



This example shows a cluster of 'A' controls (1-5) with a 'conventional' control (6) nearby.

The area contains a total of 8 marker flags, one for each of the five 'A' controls and three for the conventional control.

All 5 'A' controls are viewed in this example from a common viewing point (but separate viewing points can be used).

#1. Spur, upper part – marker flag correct (A)

#2. Spur, upper part – no flag (Z). The flag is on the nearby spur to the east.

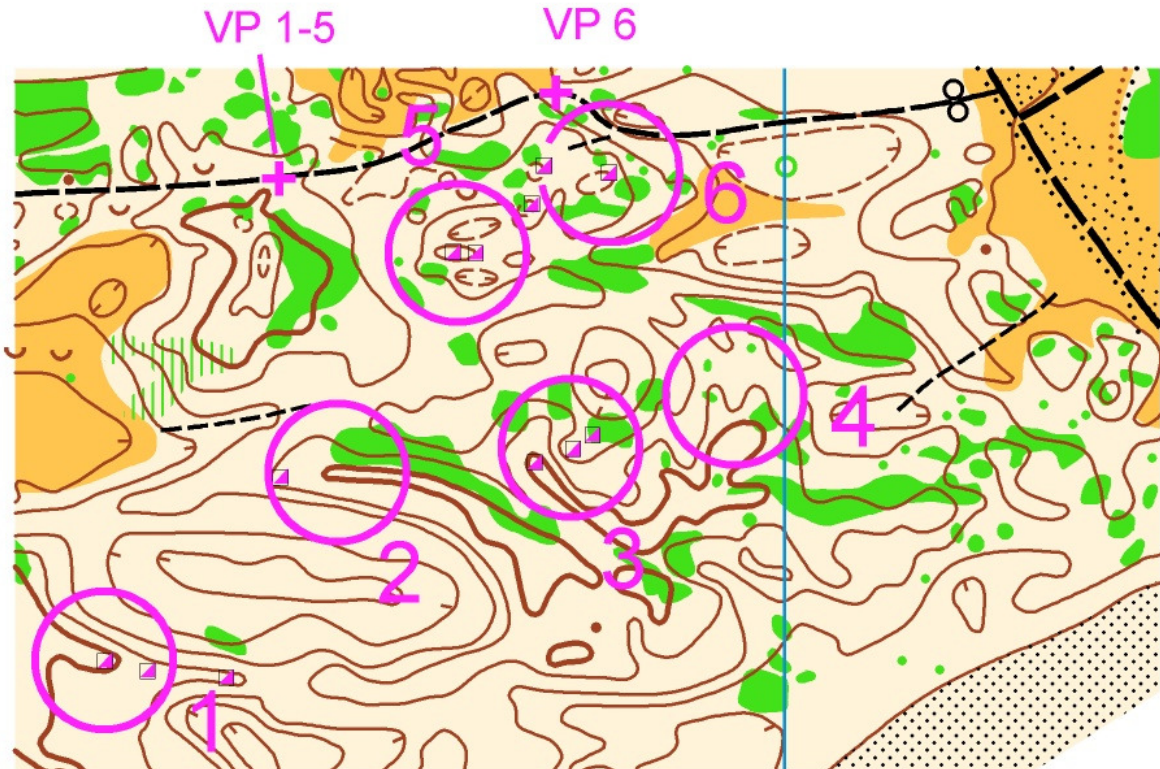
#3. Re-entrant – Flag correct (A). Note that the Control 2 flag is close but on a clearly different feature.

#4. Re-entrant – No flag (Z). The flag is in the next re-entrant to the SW.

#5. W Hill – Flag correct (A). The flags to the NE can be seen from the cluster viewing point. They are on similar features but, since they are outside the Control 5 circle, they are not interfering. A Control 6 flag on the east hill in the Control 5 circle would interfere and not be acceptable.

#6. Hill, NE foot. A-D, Flag A is the answer. Note that the Control 5 flag is visible from the Control 6 viewing point and is then the 4<sup>th</sup> flag for that control. Alternatively, it could be taped off and the problem is then A-C.

**Example of 'A' cluster not recommended for IOF competition**



This is the same cluster but with additional and rearranged marker flags. Although the A or Z answers are unchanged, this 'A' cluster arrangement is not approved for the following reasons.

- #1. Three flags not one. This is really a conventional A-C problem not an 'A' control.
- #2. Two flags on similar features not one. Either the flag lower down on the same spur or the flag on the next spur to the east, is acceptable, but not both. The eastern flag is preferred because it has the correct description and is a legitimate distracter for Control 3.
- #3. Two flags on the same feature, an A-B choice, with the answer B. The extra flag is that from Control 4 and should not have encroached on Control 3.
- #4. The Control 4 flag should be in either of the re-entrants immediately to the SW (as in the approved map) or just NW of the Control 4 circle.
- #5. Two flags on the feature. This is a conventional A-B problem, with the answer B, not an 'A' control.
- #6. No change. If taped, A-C.



**INTERNATIONAL ORIENTEERING FEDERATION  
TRAIL ORIENTEERING COMMISSION**

**TECHNICAL NOTE 12/02**

**TIMED CONTROL PROCEDURES** (Guideline)

**1. What are timed controls?**

At a timed control in trail orienteering we measure the times taken by competitors to solve control problems, from when they are given the map to when they give an answer.

In the Classic form of trail orienteering the time controls are used to separate competitors with the same point scores for correct answers. The number of timed controls, additional to the main course, is usually 2-4 in number. The competitor with the fastest overall time at the timed controls for any particular final score is ranked above slower competitors with the same score.

In the TempO form of competition all the controls are timed. In this competition there are several stations and many controls.

**2. Basic requirements of timed controls procedure**

At a **single** timed control the competitor is introduced to the terrain, then immediately given a map complete with a control circle and a description.

The timing starts at this point, with two stop watches.

The competitor gives an answer and the timing stops.

Both times and the answer are entered on a record sheet and repeated on the competitor's control card.

At a **multiple** timed control the logic is the same but there are two ways to proceed:

1. The maps can be handed out in turn and each is timed separately.
2. The maps are handed out as a set and the timing is from then until the last answer.

In Classic TrailO both procedures are used. The second procedure is usual in TempO.

**3. Typical detailed procedure at a timed control**

It is usual to view the terrain and flags from a shelter.

In the shelter, over the viewing point, there is a chair. For wheelchair users the seat is placed to one side and the wheelchair manoeuvred into position over the VP marker.

The normal staffing is for three officials, the recorder plus two timing officials. It is possible, but more difficult, to manage with two officials by overlapping duties. Two is a minimum, four is fully staffed.





A timed control at WTOC 2008. Seated competitors have the same view as those in wheelchairs.

The competitors are held at a stop point some distance away, from which they cannot see the control terrain and flags. They are brought forward one by one. The fourth official can be usefully employed for this but an alternative is to place a suitable notice at the stop point and the recorder or one of the other officials calls the competitors forward.



As the competitor comes into the shelter the control card is handed over. The competitor's details (name and number) are entered into the record.

At least one timing official stands in front of the chair to block the view of the terrain and flags while the competitor settles.

Once settled, the competitor is introduced to the terrain with a standard routine. The officials step aside and one of them points out the flags in turn, speaking the labels: **Alpha, Bravo, Charlie, Delta, Echo, (Foxtrot)**. This takes about one second per flag.

Competitors are not allowed to slow this process by saying they cannot see one of the flags. Sometimes flags can be difficult to see easily (sunshine, flags at very different heights or distances, etc). In these cases the official should add additional information to precisely indicate flag positions to competitors, such as "far away", "beside ...", "behind ...". The official's statement should be the same for all competitors.

Immediately following the pointing out of the last flag the competitor is handed one or more maps with the words **the time starts now**.

***For Classic one map at a time (2.1 above):***

The competitor gives an answer and the **timing stops**. The timing officials step back to block the view.

The answer is given either by speaking, using the International Phonetic Alphabet "**Alpha, Bravo, Charlie, Delta, Echo, (Foxtrot)**" or by pointing out the letter on a pointing strip, or both. The pointing letters may be on the map or a separate card or, as in the photograph, on a trestle in front of the competitor.



The answer is repeated by the recorder and entered into the records, together with the two times, each rounded down to completed seconds.

[The reason the recorder repeats the answer is to confirm the selection and avoid problems where the competitor's pronunciation is not clear.]

The competitor is allowed a maximum of 60 seconds to give an answer. A ten seconds-to-go warning is given at 50 seconds.

Once the times and answer are recorded the watches are re-set, the officials step aside and the **timing starts again** as the next map is handed to the competitor. The answer is given and the **timing stops**. The answer and the two stopwatch times are recorded.

***For Tempo several maps together (2.2 above):***

The competitor is given a set of maps in order. It is essential that the order is checked before handing the maps to the competitor.

The competitor considers the problem on the **first map** and gives an answer. This answer is repeated by the recorder and entered in the records.

Without delay the competitor considers the problem on the **second map** and gives an answer. Again the answer is repeated by the recorder and entered into the records.

Without delay the competitor continues to the **last map** and gives an answer. The **timing stops**.

Competitors must follow the map order and deal with each map without reference to earlier or later maps.

The two stopwatch times are entered in the records.

***Finally ...***

Finally, whatever system is in use, the times and answers are copied onto the competitor's control card and the competitor departs the timed control station.

#### **4. The future**

The system described here is that of manual timing and manual recording of answers and times.

Electronic recording of answers and times is being investigated by the IOF.

Brian-Henry Parker  
IOF TrailO Commission  
with assistance from Jari Turto (FIN)

March 2012



**INTERNATIONAL ORIENTEERING FEDERATION  
TRAIL ORIENTEERING COMMISSION**

**TECHNICAL NOTE 10/01 (Discussion Paper)**

**NATIONAL RANKING POINTS SCHEME**

A very simple ranking scheme, which has seen use, is to award points for place order in the results list, starting from the top (e.g. first gets 100 pts, second gets 99 points, and so on). This scheme has serious disadvantages in that it does not reflect the quality of the performances. A single point separates adjacent competitors, irrespective of how close or how far apart their results are. At the bottom of the list, poor performance is unfairly rewarded. For example, as an example of *reductio ad absurdum*, an absolute novice who had a zero score in a 25 competitor event would get 76 points. There is also the problem of how to rank a 100+ competitors event.

This technical note proposes a scheme more related to merit. Competitors with the same scores and separated by only a few seconds receive points that are close together.

Trail orienteering results are ranked in terms of two parameters, the primary ranking in order of correct answers and secondary ranking in terms of time awarded at the timed controls to separate those with the same number of correct answers.

In this proposed ranking scheme the primary ranking points are the percentage ratios of eligible competitors' scores compared with the winning eligible score, which is awarded a primary score of 100 points.

These points are then reduced according to the time taken at the time controls, compared with the maximum time penalty (under current rules, 120 seconds per timed control, if no answer given). This is scaled such that a maximum time penalty is equivalent to the points score for a correct answer so that, for example, a competitor with 13 controls correct but with maximum time penalty would receive points equivalent to 12 controls correct and no time penalty.

The algorithm is as follows:

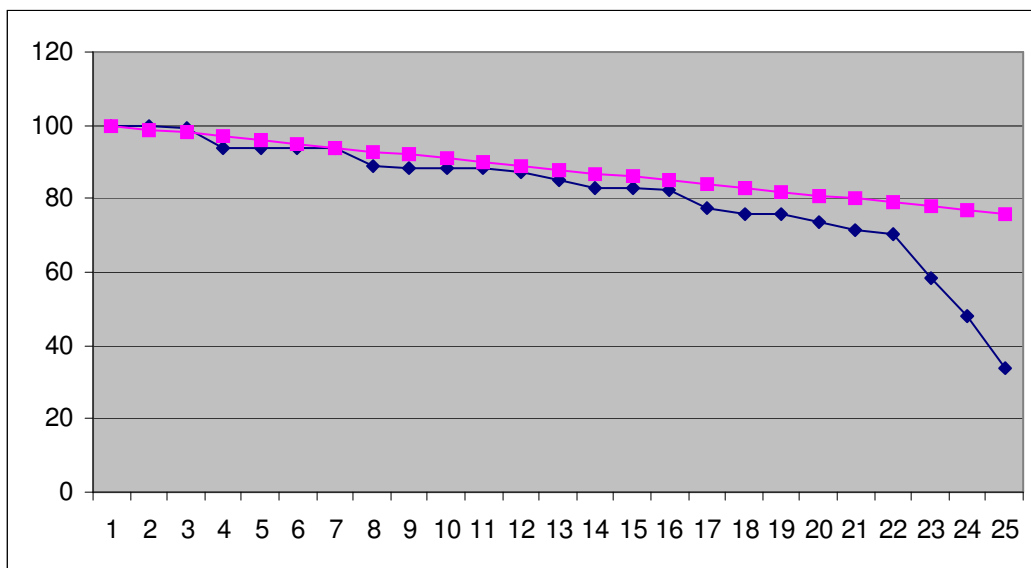
Competitor's ranking	<b>RP = A - B</b> points
where	$A = \frac{\text{Competitor's score}}{\text{Winner's score}} \times 100$
	$B = \frac{\text{Competitor's time}}{\text{Maximum time penalty}} \times \frac{100}{\text{Winner's score}}$

Here is a single example. A competitor has 17 controls correct and a time of 155 seconds. The winner had 20 controls correct and there were two time controls.

$$A = \frac{17}{20} \times 100 = 85.0; \quad B = \frac{155}{240} \times \frac{100}{20} = 3.25; \quad RP = 85 - 3.5 = 81.5 \text{ pts}$$

The following is an example based on a national ranking event in Norway which had two timed controls. You might find the totals of 5 seconds and 7 seconds for the two timed controls somewhat remarkable, but the purpose here is to demonstrate the use of the algorithm and compare it with the simple one point for each place system.

		Score	Time	A	B	RP=A-B	Simple Ranking Points
1	KW	18	7	100.00	0.16	99.84	100
2	LJW	18	10	100.00	0.23	99.77	99
3	KO	18	23	100.00	0.53	99.44	98
4	GMØ	17	18	94.44	0.41	94.03	97
5	AA	17	20	94.44	0.46	93.98	96
6	MO	17	24	94.44	0.56	93.84	95
7	JEH	17	27	94.44	0.62	93.82	94
8	MJ	16	5	88.89	0.12	88.77	93
9	AS	16	16	88.89	0.37	88.52	92
10	OJW	16	17	88.89	0.39	88.50	91
11	OAS	16	19	88.89	0.44	88.45	90
12	ER	16	74	88.89	1.71	87.18	89
13	BP	16	162	88.89	3.75	85.14	88
14	TAA	15	15	83.33	0.35	82.98	87
15	BEP	15	27	83.33	0.62	82.71	86
16	MB	15	31	83.33	0.72	82.61	85
17	KI	14	19	77.78	0.44	77.34	84
18	HI	14	82	77.78	1.90	75.88	83
19	II	14	87	77.78	2.01	75.77	82
20	PF	14	180	77.78	4.13	73.65	81
21	TAO	13	24	72.22	0.56	71.66	80
22	OH	13	74	72.22	1.71	70.51	79
23	JF	11	125	61.11	2.89	58.22	78
24	EP	9	93	50.00	2.15	47.85	77
25	LM	7	210	38.89	4.86	34.03	76



The results table and the graph show the clear difference between the proposed scheme (blue) and the simple scheme (magenta). The latter is simply ranking order, and takes no account of the detail of the performances. The proposed scheme, on the other hand, shows that the better competitors are grouped according to their correct control scores and, because their times are close to each other, their ranking points are also close, which is the intention.

Note also that, at the poorer end of the results, the points fall away and poor performances are not artificially inflated.

## **Conclusion**

Although the proposed ranking scheme has been shown to be workable (it has been adopted by one federation), there could be concern that the effect of the secondary ranking in terms of time is considerably reduced by the 120 seconds possible total penalty per control. Since the time differences between good competitors are usually small, only a few seconds or few tens of seconds (as shown in the example list above), the comparison of these with the possible maximum 120 seconds produces relative differences that might be considered too small.

Perhaps it is appropriate to re-visit rule 25.2 for timed controls in which a wrong answer is awarded no points and an additional time penalty.

Possible alternatives are:

- Continue with awarding points for correct timed controls but abolish the additional 60 seconds time penalty for each incorrect timed control answer;
- Do not award points at timed controls, these to be scored as time taken plus penalty time for wrong answer (as for TempO).

What do you think?

## **2010 Update**

The algorithm suggested here has been adopted by British Orienteering for its team selection.

Brian-Henry Parker  
IOF Trail Orienteering Commission Member  
November 2009. Reissued with minor changes June 2010

This document has been issued for discussion, particularly with respect to the rule 25.2 alternatives. Please be free to feed back any comments.
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**INTERNATIONAL ORIENTEERING FEDERATION  
TRAIL ORIENTEERING COMMISSION**

**TECHNICAL NOTE 10/03 (Guideline Revision)**

**LONG DISTANCE CONTROLS**

There has been increasing use of long distance controls in international and national competition. In Japan, for instance, many young course-setters have been planning LONG distance controls in the events recently, saying they have experienced such controls in WTOC 2008 and 2009. In the absence of comment by the SEAs or guidance from the TOC, they assume that such controls are permitted or even encouraged.

We think that there are serious disadvantages in long distance control setting. As a telling example of the difficulties that can arise with such controls, consider the first timed control on Day 1 at WTOC 2009. This was a superbly scenic control, viewed across a large sink hole in the limestone terrain, as seen in the photograph:



This is one of the most attractive control site seen in trail orienteering, but there was a technical problem. Much can be seen in this photograph – the house, the edge of the forest, the individual small trees. What cannot be seen are the flags! However, a photograph is not as informative as the real view. To allow for this the photograph has been cropped and greatly enlarged:



This improved representation is similar to, possibly a little better than, the resolution of the naked eye from the timed control viewing position. The two flags at the edge of the trees are now visible. Two flags?! The control description was A-D. The other two flags, also on the forest edge are in shadow; one half way between the two visible flags and the other by the very small bush towards the top right of the photograph.

This difficulty in identifying the two controls in shadow was faced by the first competitors through the timed control. Later the movement of the sun lit up these other flags and, although very distant, all four flags could be seen by those with good vision.

The near impossibility of earlier competitors seeing all flags, due to distance and poor light, gave rise to formal protests. The near impossibility of competitors with less than very acute vision seeing all flags even in good sunlight was not raised formally at the time but needs to be discussed.

We believe that controls set at distances such as this should be avoided. This control has been selected for discussion because we have the photographs to illustrate the point. There are many other examples.

The suggestion has been made to use larger flags than those specified in rule 20.2 at extra-long distance controls. Although this would have resolved the difficulty, we think that it is completely opposed to the principle that trail orienteering should stay as close to foot orienteering as is possible. We think that each correct position of the flags in the cluster at the control has to be confirmed only with the regular-sized flags. If competitors cannot confirm the flag position because of distance, it shall not be a GOOD control.

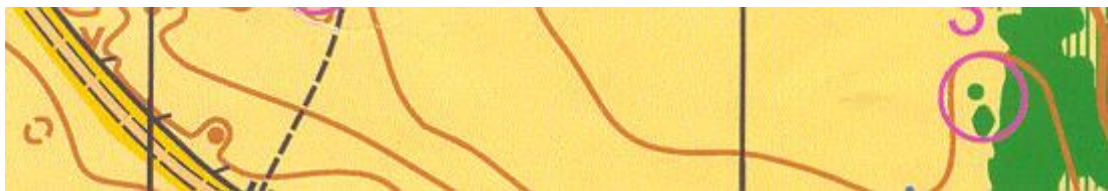
Does this mean that the distance between viewing point and the control should be regulated within a limited (or standard) recommended distance? What that distance should be is to be debated, assisted by further information in this paper.

There are several reasons why distant controls may be difficult which, in combination, may make a control unacceptable:

- Small relative size of distant features, requiring 20/20 vision;
- Poor contrast against background which may change with time, due to movement of the sun, clouds and swinging of the flags in the wind;
- Fog – mist – rain reducing visibility;
- Difficulty in judging depth of view, large movements along track needed to alter the angle of view and gain parallax information.

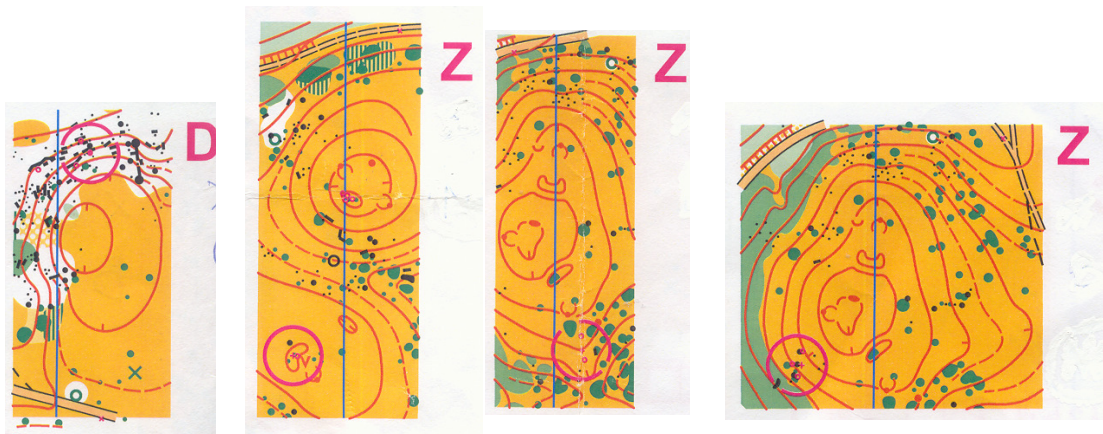
### Examples of long-range controls with difficulties

In following example from the UK the distance from the viewing point to the control was 350m. Although the light was good and the flags were clearly visible, it was not possible to judge depth of view at that range and moving along the track from the viewing position did not give enough change of parallax to assist.



JK09 D2-3 350m

An event with a high proportion of long-distance controls, because of the open and large-featured terrain, was Day 1 at WTCO 2009 and it is useful to look at a selection. This is not to say these examples showed errors of planning. They did not contravene any guideline or established good practice, but competitors had some difficulties with long-distance sighting. Here is a selection, with ranges:



D1-3 105m

D1-8 135m

D1-19 120m

D1-20 120m

Control D1-3 was in the shadow of trees and, although the correct flag on the correct rock face could be identified, it was very difficult seeing all four flags at that distance with poor contrast, in order to give an answer.

Control D1-8 introduced the concept of micro precision at long range, with a flag being very close to the centre of the circle, some competitors saying that it was within error limits for flag placement, others judging that the offset was a deliberate zero.

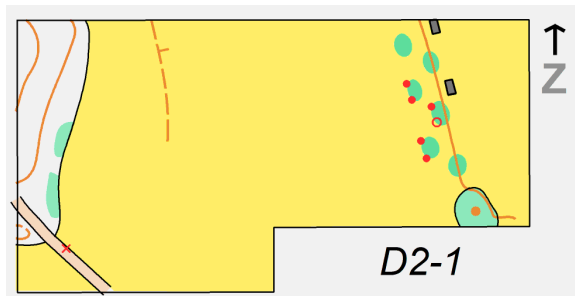


Control D1-19 was another very small (3m) displacement of the flag at long range and flag B looked about right in relation to the nearby features. Again the difficulty was deciding if it was misplaced enough to be a zero.

Control D1-20. Again a small deliberate flag displacement with difficulty in seeing the rock and vegetation features.

In these examples from WTOC 2009 the difficulties arose mainly because of the long distance of the control from the viewing point, together with the use of micro-precision zeroes.

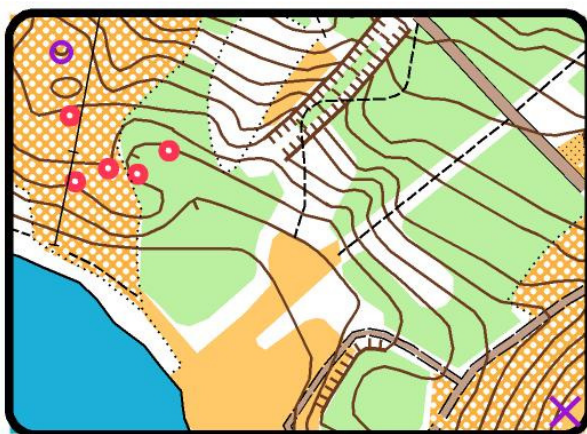
### Examples of successful long-range controls



This control at WTOC 2004 was 140m from the viewing point. The flags were clearly visible against the dark green of the thickets. Reference to the hut suggested that flag D was at the control but moving up and down the

track gave enough parallax change, to show that this flag was on the front row of thickets and that the rear thicket had no flag in the described position.

Despite the long distance, competitors considered this a successful control.



Z



This WTOC 2006 depression, some 230m from the viewing point, could not be seen at that distance. Its rough location to the north of the hill and beyond the power line could be identified and, with no flag anywhere near there, the answer had to be zero.

The competitors were not troubled by this control, despite its long distance, because it was a simple zero. Any attempt to place a flag on or near the invisible depression would not have worked.

These two long-range controls that succeeded were clear, macro-precision zeroes.

**Recommendation:**

We advise against long-range controls that are more a test of acute vision than map reading and terrain recognition. Our analysis of such controls leads us to suggest that, in general, difficulties in visibility due to range appear at ranges greater than 75m. We therefore suggest:

**Planners and controllers are asked to take note that long-range controls (<75m) can be more a test of eyesight than terrain interpretation and that, if such controls are used, care is taken to ensure that all flags will remain clearly visible during the competition under possibly varying conditions of sunlight, shade, wind disturbance of flags, changing weather, etc. which affect the contrast of flag against background.**

**Planners and controllers are also asked to take care in using small flag displacements at long range for zero answer controls, such displacements being obvious when placing the flags at the feature but difficult to determine from long distance.**

These recommendations will be incorporated in the next revision of the Technical Guidelines.
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Taro Koyama  
Brian-Henry Parker  
IOF Trail Orienteering Commission members  
June 2010



**INTERNATIONAL ORIENTEERING FEDERATION  
TRAIL ORIENTEERING COMMISSION**

**TECHNICAL NOTE 09/02**

**OUTLINE SPECIFICATION FOR TEMPO**

TempO may be considered a 'sprint' version of 'classic' trail orienteering.

The 'classic' form of trail orienteering tests skills of map reading and terrain interpretation, requiring competitors to view, from the tracks, various numbers of flags around features in the terrain. The task is to decide which flag, or none, agrees with the centre of the circle on the map and the description of the feature there. The main part of a trail orienteering course is not competitively timed and participants are ranked according to the number of correct answers given. In order to separate those with equal scores, one or more special timed controls are set in which the speed of answering is recorded.

The 'sprint' format of TempO is a development of the timed control concept. A TempO course consists of a number of stations from which can be seen clusters of flags. At each station the competitors are given a set of maps, each map showing a different control circle and description. The answers, in sequence order, and the overall time between map issue and last answer are recorded. On completion of the course the competitors are awarded a total time, which is the accumulated time at all of the stations plus time penalties for wrong answers. A typical time penalty is 45 sec. The winner is the competitor with the lowest total adjusted time.

An elite standard TempO competition might have five stations with up to five maps per station. In this format the 'zero option (Z)', no flag at the centre of the circle and in accordance with the control description, is permitted (but not obligatory) and this can greatly increase the level of potential difficulty. TempO thus presents a considerable intellectual challenge with competitors having to make testing technical decisions in the shortest possible time.

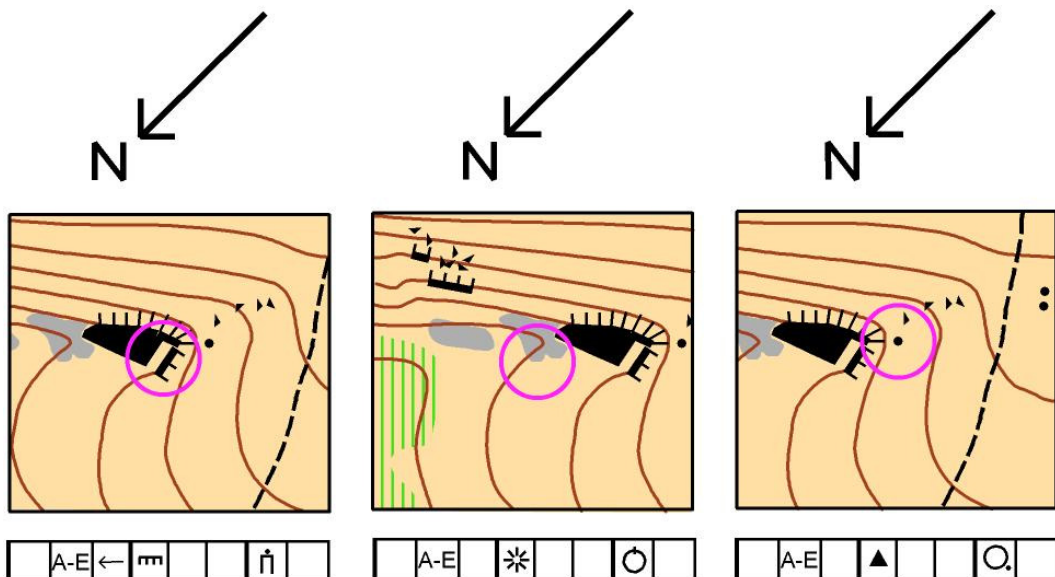
To date at WTOC timed controls, times and answers have been manually recorded by officials. Electronic recording has been successfully demonstrated for TempO using sets of standard recording units at the stations and software developed to give instant overall scores on download. Future development being pursued is to radio link the recording units with the results computer so that the progress of a competitor could be displayed in real time, thus offering spectator possibilities.

Take up of TempO at demonstration events in Scandinavia and elsewhere has been particularly encouraging, especially among able-bodied young orienteers, who respond to the challenge of quick thinking. It appears possible that, following the introduction of a Tempo world competition, competitor numbers would rise to the point whereby qualification heats and a final would be necessary. TempO is well suited to such an arrangement as the overall competition time is short compared with the classic format.

The aim of the IOF is eventually for WTOC to contain both classic and TempO formats. As an intermediate step, before awarding TempO full world championship status, it is intended to stage world competition at a lesser level.

## An example of a Tempo station

*"There are five flags: From the left, Alpha, Bravo, Charlie, Delta, Echo. There are three maps. Your time starts now!"*



The answers are coded at the bottom of the page.

Brian-Henry Parker  
 IOF Trail Orienteering Commission 2010  
 September 2009. Reissued with minor changes June 2010

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The correct answer letters are, in order, in the word: DANZIG



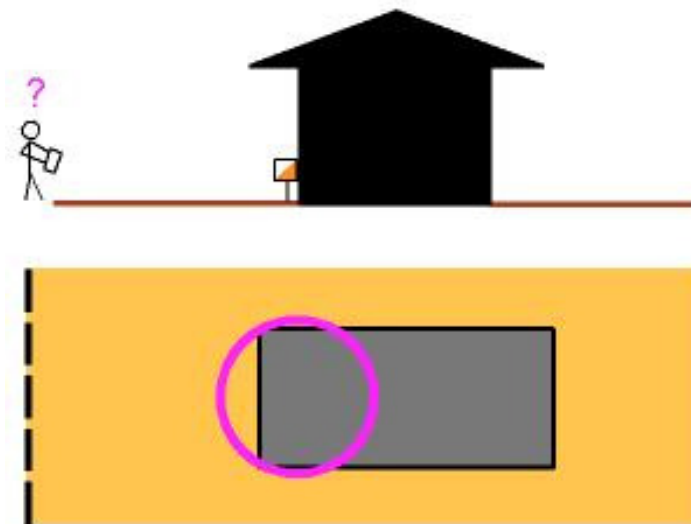
INTERNATIONAL ORIENTEERING FEDERATION  
TRAIL ORIENTEERING COMMISSION

## TECHNICAL NOTE 09/01 (Guideline Revision)

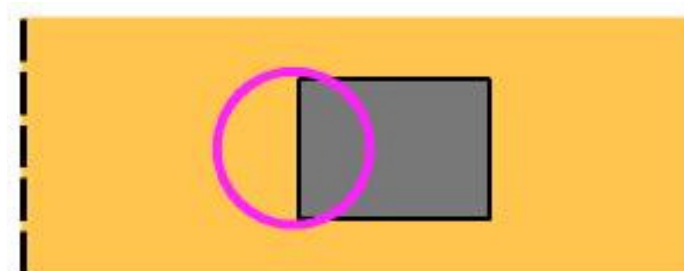
### **BUILDINGS AND OVERHANGS**

Commission member Taro Koyama (JPN) reported problems of mapping and flag placement with buildings that have very wide roof overhangs. If the mapping is based on aerial photography, without precision ground survey correction, the building representation on the map is likely to include the roof overhang. This can produce difficulties with placing flags at the side of the building and positioning the centre of the circle with precision on the map.

This is seen in the diagram:



Clearly, in this unusual case, this is a false representation. The map should show the 'footprint' of the building, the base at ground level, as in the next diagram.



Since most overhangs are small, the difference between the footprint and the bird's eye view representation is not of importance. A 1m overhang is only 0.2 mm on the 5000 scale map.

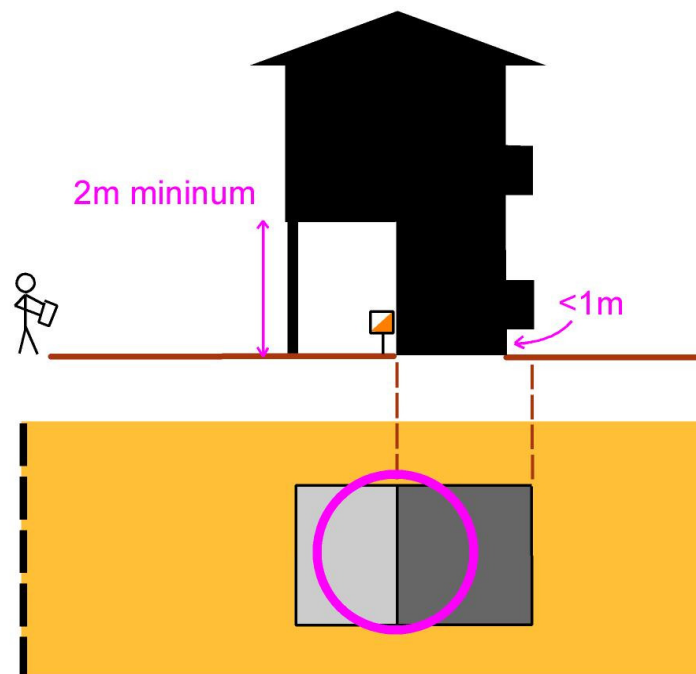
But what about very wide overhangs? If wide enough, they should be mapped. We can use the ISSOM canopy light grey symbol for this.

As well as width, we have to consider height, when deciding whether an overhang should be mapped. To be compatible with foot orienteering concepts in mapping, it has to be one that a person can walk/run under, which means a minimum height for the overhang of 2 metres.

But what if a wide overhang has a clearance of less than 2m? We had several examples of this at the event centre near Joensuu, Finland for WTOC 2006, where there were low balconies extending out from the buildings instead of being built up from the ground. If the clearance is less than 1m, the minimum height to accommodate a control flag, the overhang should be included in the footprint.

But what if the overhang clearance is between 1m and 2m? The answer in this case is to map it as you see fit but do not use it for trail orienteering controls. .

These concepts can be seen in the next diagram:



**Recommendations: Where buildings are used as controls, care should be taken to ensure that a building representation on the map is its footprint, ignoring minor overhangs. Large overhangs/canopies with 2m clearances under them should be mapped according to the ISSOM specification.**

These recommendations will be incorporated into the next revision of the Guidelines.

Brian-Henry Parker  
IOF Trail Orienteering Commission Member  
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