

COURSE PLANNING WORKSHOP

Feb 22 2023 – Session 2



Essentials Of Course Planning

Reference: OA Foot Rules Appendix 2

- Courses should be correctly designed for the expected abilities (technical and physical) of participants
- Orienteering is running navigation, terrain needs to be runnable
- Fairness - Course planner needs to ensure that the contest is fair, all competitors face essentially the same conditions on every part of their course, i.e. eliminate the element of luck, courses are won by the best orienteer on the day
- Competitor enjoyment - orienteers need to be satisfied with the courses they are given, courses are suitable for the competitors
- The course planner needs to be fully acquainted with the terrain
- Courses should be set that normally fit competitors can run over most of the course set for their level of ability
- Protection of wildlife and the environment
- Consideration for spectators

OA Foot Orienteering Rules

- <https://orienteering.asn.au/wp-content/uploads/2023/02/OA-Foot-Competition-Rules-2023.pdf>
- Many relevant rules and appendices for course planners
 - In particular sections relating to the event, maps, control descriptions and courses etc.

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Components of the Course

Reference: OA Foot Rules Appendix 2

- Start – mark by a control flag, course begins then
- Terrain
- Legs - fairness
- Controls
- Climb - $< 4\%$, less for the short hard courses
- Finish
- Elements of map reading
- Route choices
- Degree of Difficulty – covered in Session 1

Course Formats

Reference OA Foot Rules Appendix 8

- Long - forest
- Middle - forest
- Sprint – , generally urban, individual, relay, knockout sprint
- Forest Relay

Descriptions below are mostly from the viewpoint of Hard Navigation

Plus other variations

- Night
- Urban - Street - Park
- Score/Scatter

- MTBO – not discussed today

Course Formats

- Reference OA Foot Rules – Appendix 8
- Summary Table

SUMMARY TABLE	Sprint and sprint relay	Knockout Sprint	Middle Distance	Long Distance	Forest Relay
Controls	Technically easy, minimum 25m apart	Technically easy, minimum 25m apart	Consistently technically difficult	A mixture of technical difficulties	A mixture of technical difficulties
Route Choice	Difficult route choice, requiring high level of concentration	Difficult route choice, requiring high level of concentration	Small and medium scale route choice	Significant route choice including some large scale route choice	Small and medium scale route choice.
Type of Running	Very high speed	Very high speed	High speed but requiring runners to adjust their speed for the complexity of the terrain	Physically demanding, requiring endurance and pace judgement	High speed often in close proximity to other runners who may, or may not, have the same controls to visit
Terrain	Very runnable park, streets or forest. Spectators may be allowed along the course.	Very runnable park, streets or forest. Spectators may be allowed along the course.	Technically complex terrain	Physically tough terrain allowing good route choice possibilities	Some route choice possibilities and reasonably complex terrain
Map	1:4000 or 1:3000	1:4000 or 1:3000	1:10000	1:15000 or 1:10000	1:10000
Start Interval	1 minute (mass start for relay)	1 minute for qualification round. Mass start for knock-out rounds	2 minutes	2 minutes	Mass start
Timing	1 second (finish order for relay)	1 second for qualification round. Mass start for knock-out rounds so the finish order is the order across the line.	1 second	1 second	Finish order across line
Winning Time	12-15 minutes (per leg in the relay)	8-10 minutes for the qualification round. 6-8 minutes for the knock-out rounds.	30-35 minutes	See rules 16.9 and 16.10 and 16.11	40 minutes; See rules 16.10 and 16.13
Summary	Sprint orienteering is a fast, visible easy-to-understand format allowing orienteering to be staged within areas of significant population. The Sprint Relay is a competition for teams of four runners. Teams contain at least two women and the first and last legs are run by women.	In a Knock-Out Sprint, after initial qualification, there are a number of knock-out rounds with mass starts and first-past-the-post finishes. The races take place in a compact area. Exciting for spectators and competitors.	Middle distance orienteering requires fast, accurate orienteering for a moderately long period of time. Even small mistakes will be decisive.	Long distance orienteering tests all orienteering techniques as well as speed and physical endurance.	Relay orienteering is a competition for teams of three runners running on a virtually head-to-head basis with a first-past-the-post winner. Exciting for spectators and competitors.

References

- Articles in the SAO on Long, Middle and Sprint Formats
- Also available here -
<https://www.sa.orienteering.asn.au/about-us/technical-information>
- OSA Course Specifications – defines the courses (and classes where applicable) for the event types
- Item 2.1 on this page –
<https://www.sa.orienteering.asn.au/about-us/guidelines-and-policies>

Long Distance Course Format

- Physically demanding (relative to age group)
- Tests all orienteering techniques
- Format emphasises route choice, including large scale route choice
 - Influenced by climb, vegetation, track and path options for parts of the leg, choice of approach to the control
 - Long legs add little to a course if they have minimal route choice
 - Offering good route choice options also splits competitors as they choose the variation that suits them best
- Control placement is to achieve route choice challenge and is the end point of long leg, may not in itself be difficult
- Age/fitness will affect decision making on routes
 - Willingness to climb, go through vegetation etc.
 - A leg which provides route choice for some classes may provide none for others

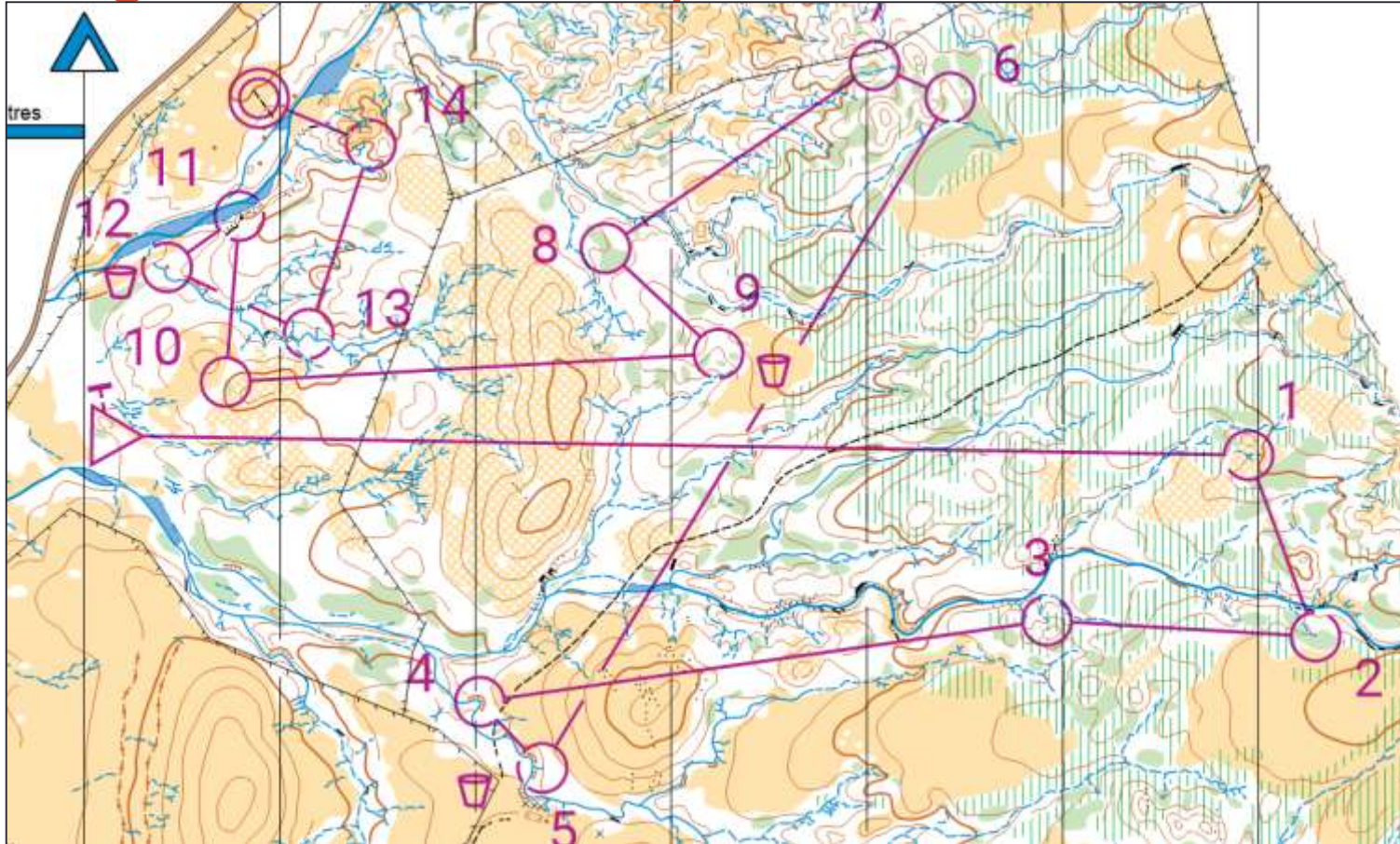
Long Distance Course Format

- Element is long legs still requiring full concentration on map reading, e.g. 1.5 – 3 km on elite courses, 1 – 1.5 km on shorter courses (ensure map reading and conc. still required)
- May include more technical sections characteristic of Middle Distance
 - More technical sections with shorter legs, more typical of Middle Distance orienteering
 - Hence these sections of a course commonly use more difficult, technical control sites
 - More intense navigation over shorter legs
 - Direction changes at controls, e.g. on consecutive legs, hence competitors need to reorient themselves frequently
- Avoid starting with a sequence of short legs with little route choice – following may occur
 - So Long Distance courses need to be broken up by having variety provided by longer legs with routes choice with more technical middle distance style sections
- 1:7,500; 1:10,000 and 1:15,000 scales depending on age groups

Long Distance Format

- Moderate course can follow the same principles as above but route choice options include more obvious linear features, and control sites are less complex.
- The ability to achieve all the elements of Long Distance Orienteering may be influenced by the orienteering map to be used, as can be seen in the example courses

Long Distance Example – M16A, W20, M55A



Hard course – route choice on longer legs influenced by green, climb, tracks and the use of the linear features (water courses). Again longer legs separated by shorter technical sections especially at the end of the course. 4 - 5 used as a turn around to avoid a dog-leg

contour interval 5m

Oceania Long Final			
M65A, W18A, W55A			
12	4.6 km		
▷		◁	
1 173	●		○
2 139	←	mm	1 L
3 140	▨		○
4 120	▨		○
5 146	↖	∩	
6 169	▲	2	○
7 177	↑	▲	1 ○
8 181	▨		○
9 180	▨		○
10 185	▲	2	○
11 178	↙	▲	1 ○
12 194	mm	2.5	L
13 131	↙	∩	
14 115	↑	mm	1 L
15 100	▨		○

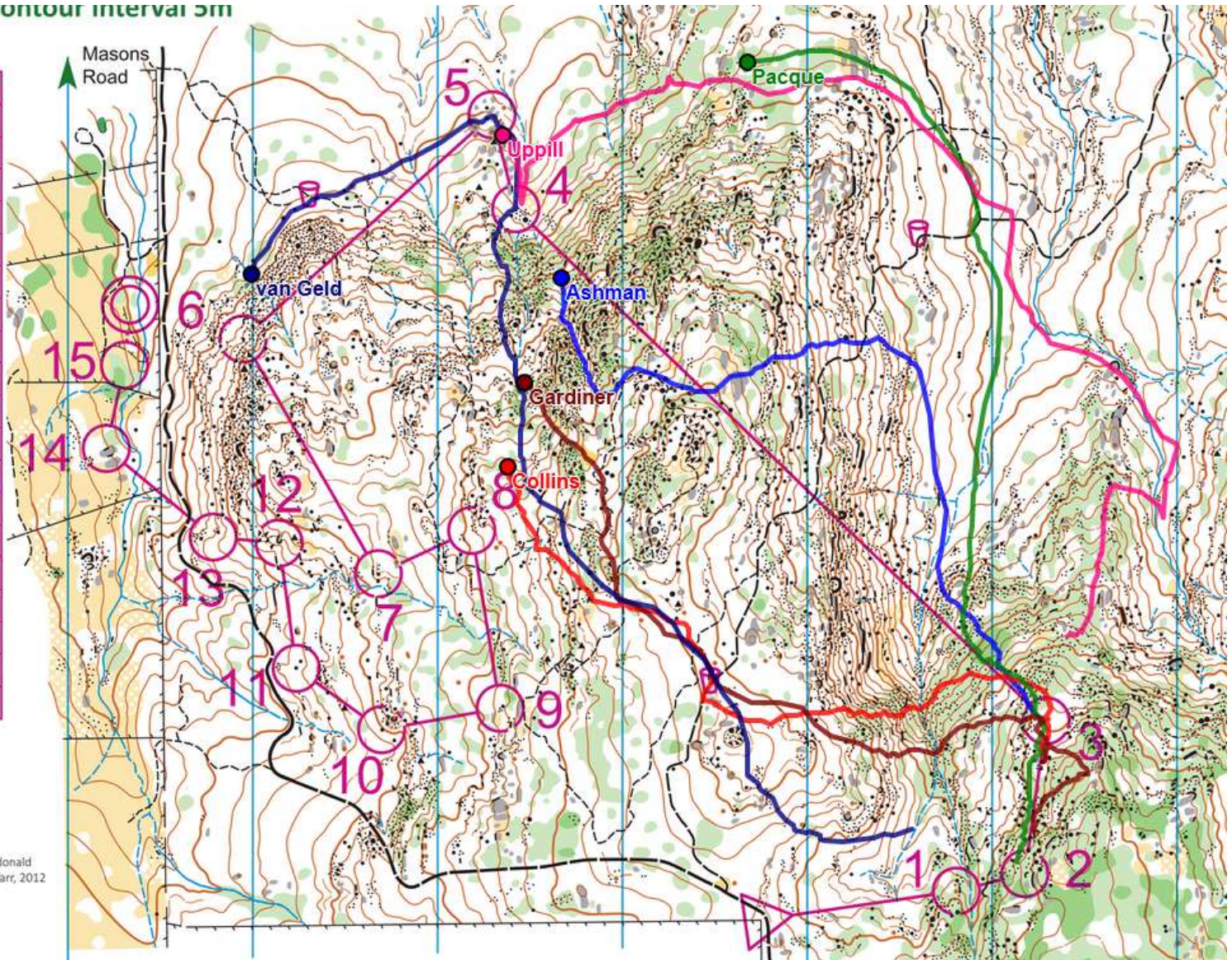
○--- 100 m --->○

www.condes.net 8.7.25 Melbourne Forest Racers
Oceania Long V15_FINAL.wxd

Original survey by Steve Key assisted by Bruce Macdonald
and Alex Tarr, 1984. Updated and redrawn by Alex Tarr, 2012

Updated to ISOM 2017 by Alex Tarr 2018
Copyright: Yarra Valley Orienteering Club 2019

Use only in the spirit of Scout Rules

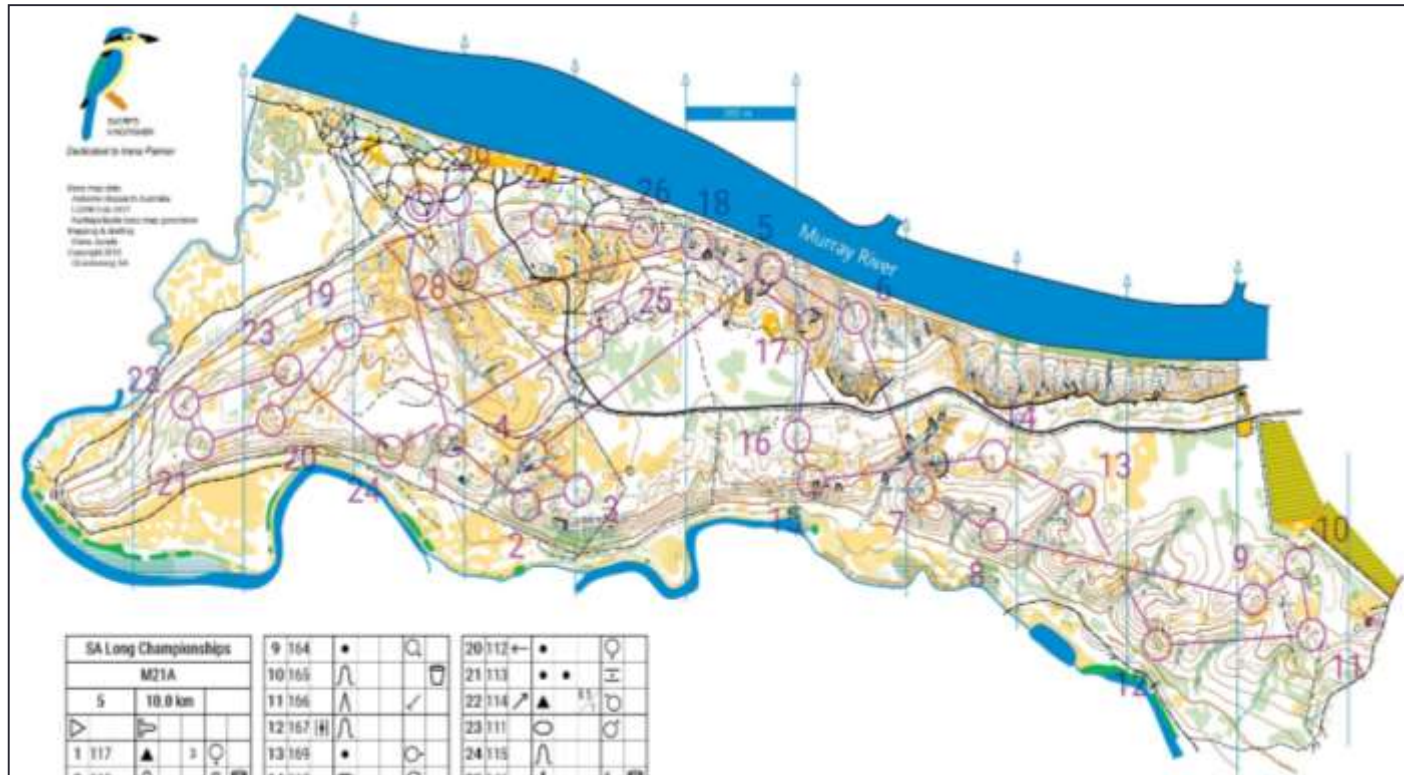


Note water controls – one on track and one late in course at a control

Long Distance Course Example

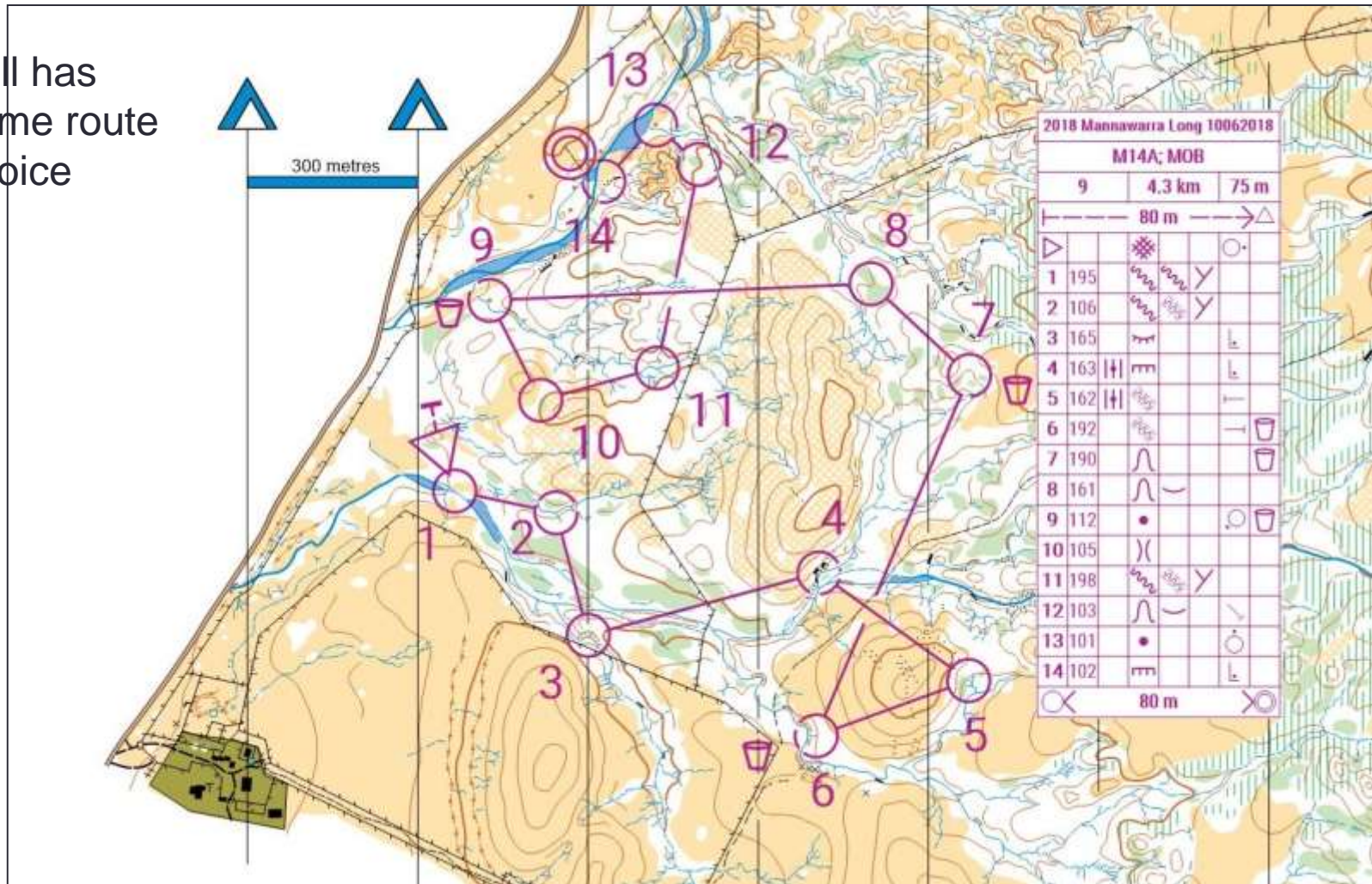
Crooked Straight – long hard courses.

- Having significant longer legs with route choice is more difficult on this map.
- Hence the course is more technical than many longer courses.
- However a number of legs of varying length still offer significant route choice to right or left
- e.g. 8 to 9 with a flatter longer left route vs a shorter right route with more climb,
- 14 to 15 similarly, in this case right is flatter,
- 18 – 19 – do climb early on the further out left route with some paths, or some early and in the middle on a more direct route, or later on the right hand route going back near the start.



Moderate Course Example

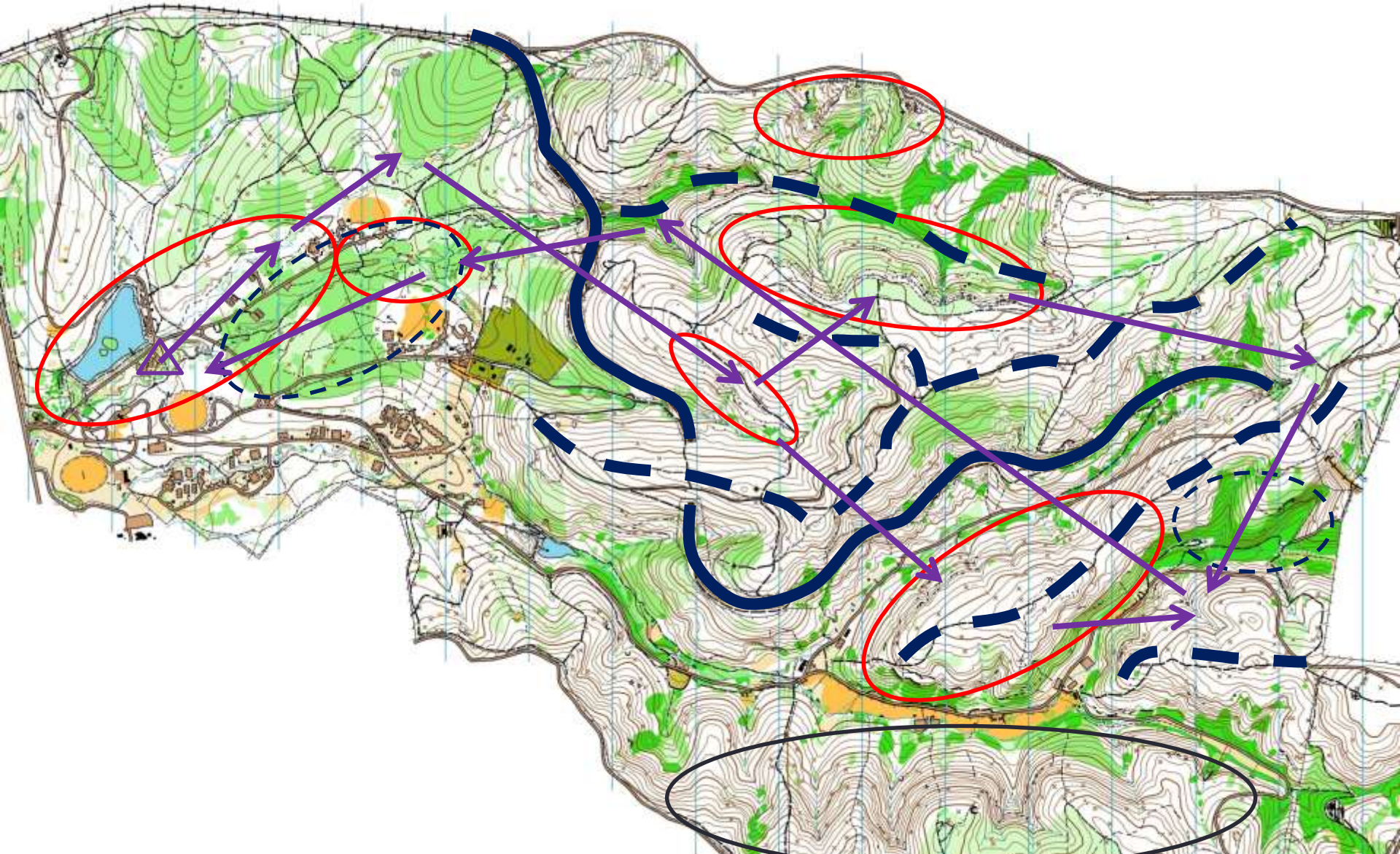
Still has
some route
choice



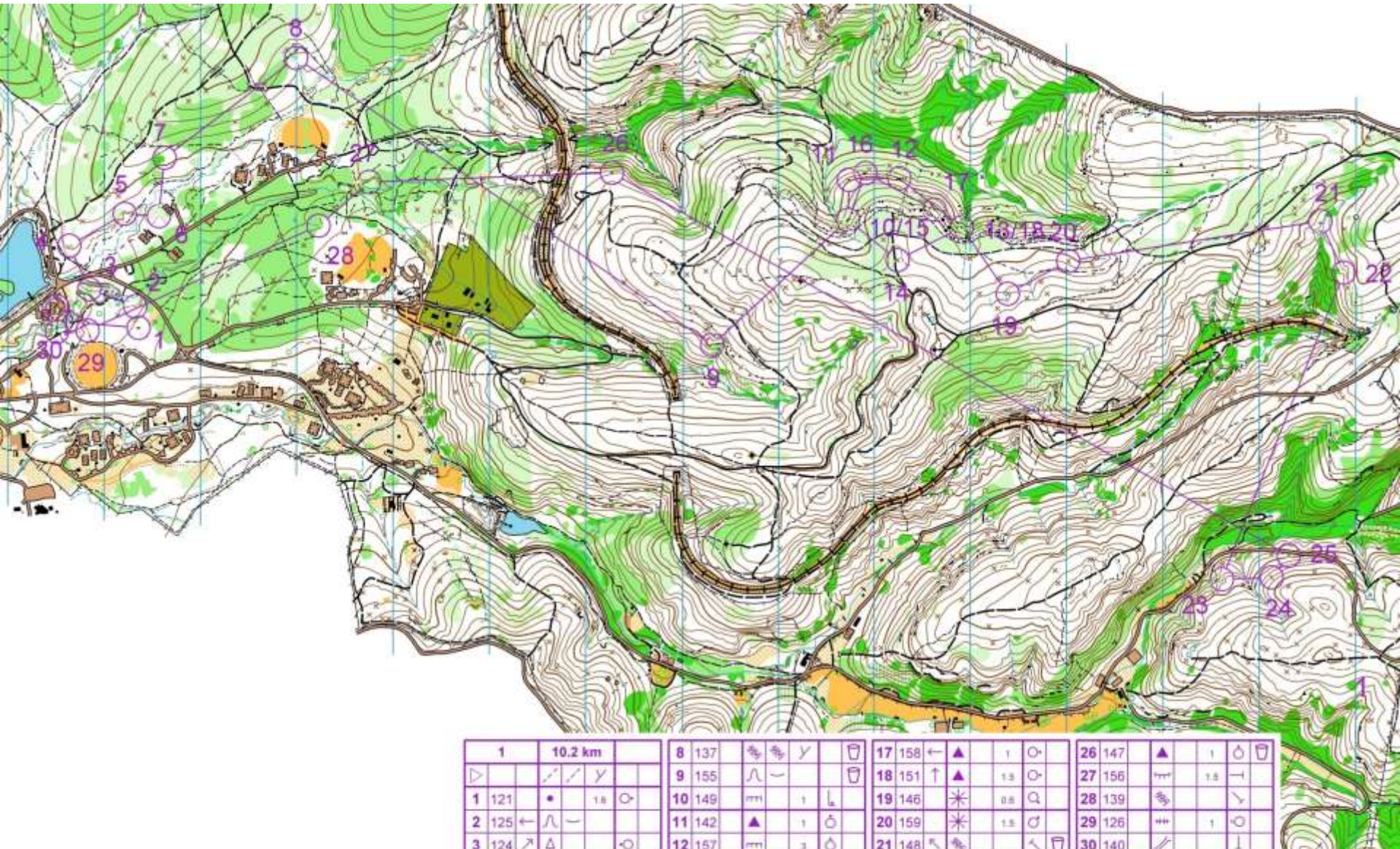
Simon's Approach - Plan basic structure of courses

- How to connect the sections of the map to be used
 - Best way to use sections, ie: downhill through detail
 - May not be able to use all areas
 - Be aware if getting to a section will compromise the course
- Features of good hard courses
 - Variable leg length
 - Direction change
 - Intensity change
 - ie: longer route choice leg followed by shorter technical legs, then longer leg again etc.
 - Require high concentration for extended period
 - ie: consecutive difficult controls with no easy feature on any of the legs
- The different course formats place different emphasis on the type of structure

Plan basic structure of courses



Plan basic structure of courses

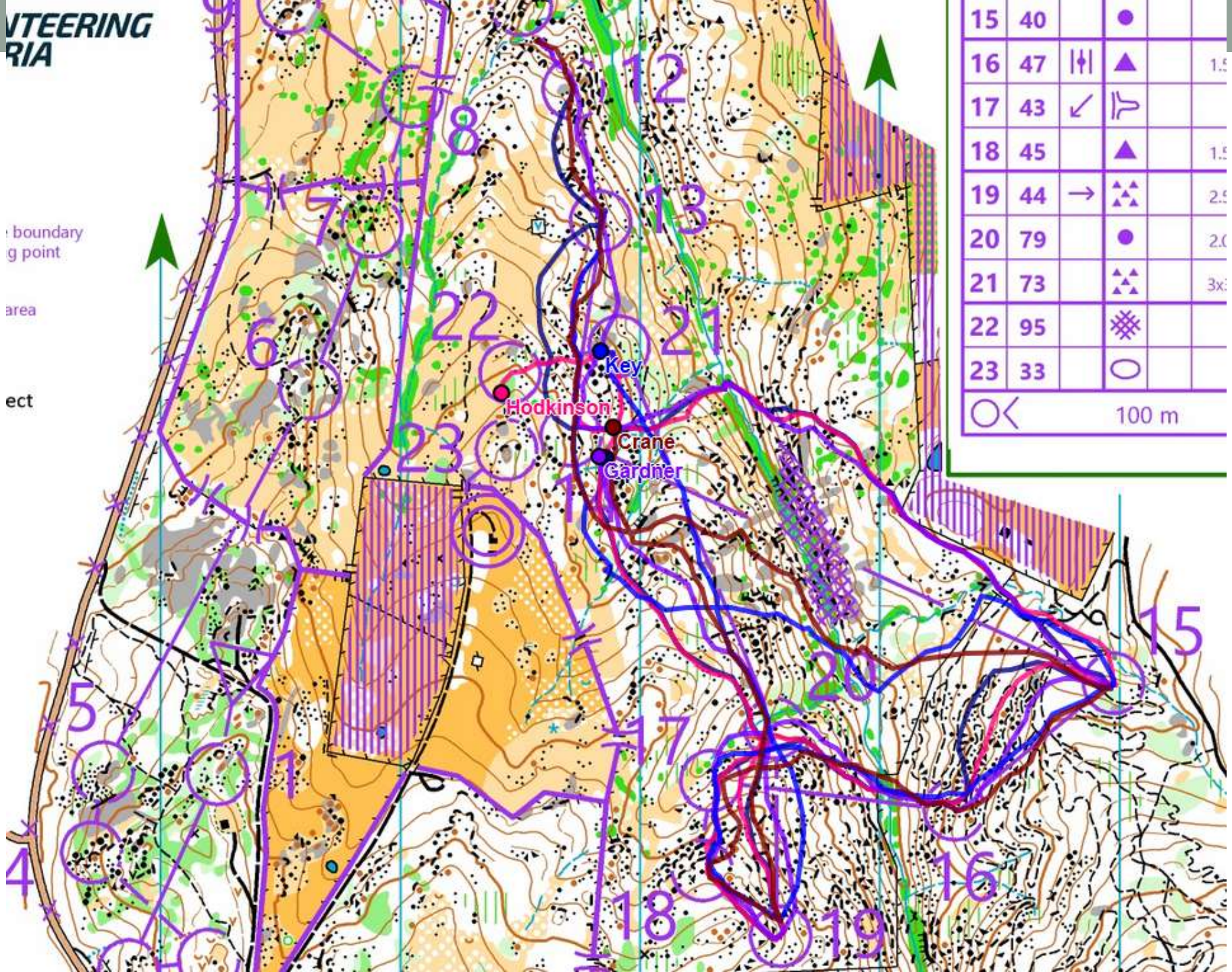


Middle Distance Course Format

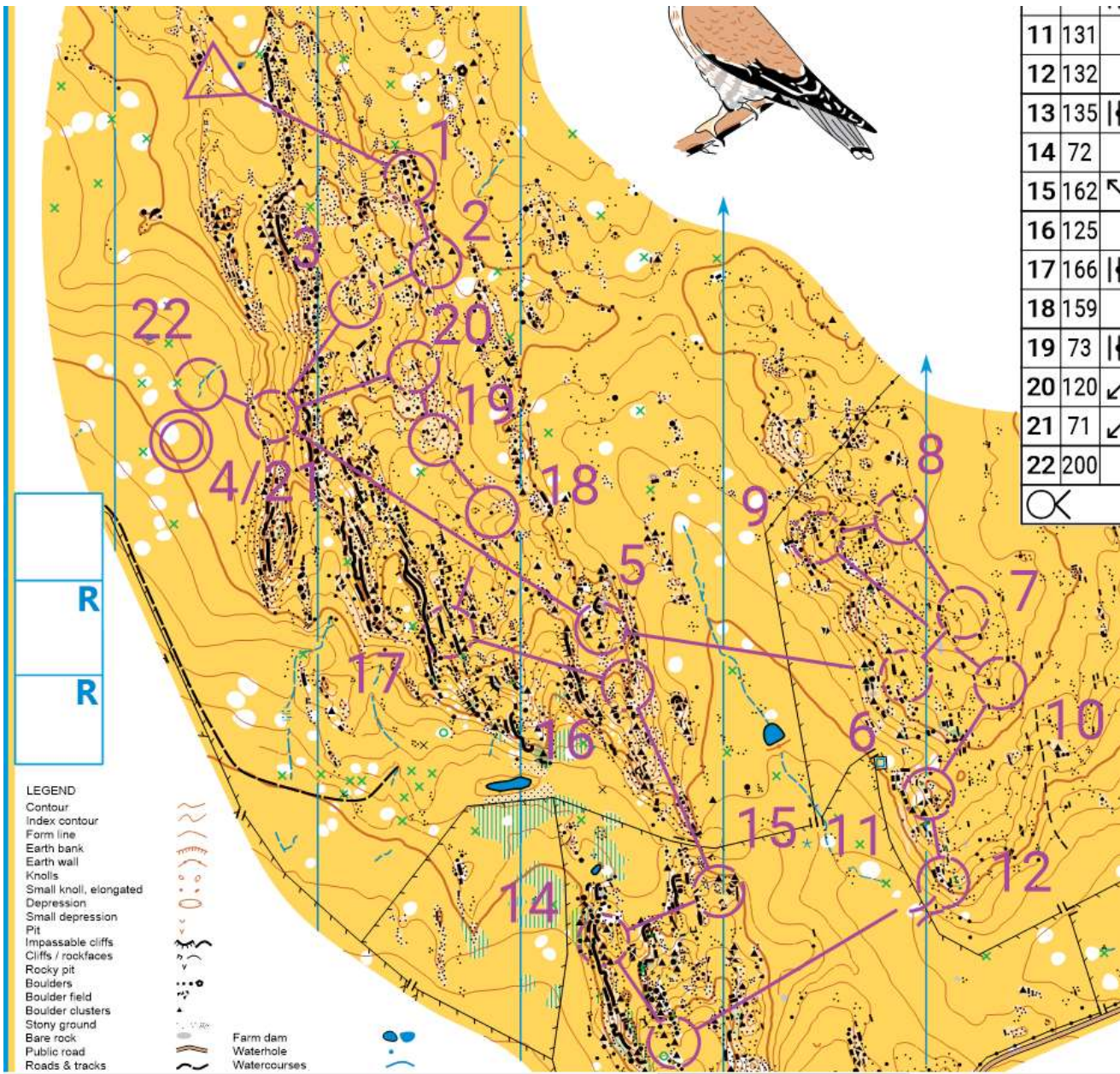
- Profile is technical
- Emphasis on detailed navigation
- Requires constant concentration on map reading
- Shifts in running direction out from controls
- Shifts in speed through varied terrain types
- Small and medium scale route choice
- Controls themselves are technical
- Map scale is commonly 1:10,000 scale (map is a strict enlargement of a 1:15 000 scale map)
- 1:7,500 for older age groups

INTERVIEWING GIA

boundary
point
area
ect



15	40		●	
16	47		▲	1.5
17	43	↙	⊥	
18	45		▲	1.5
19	44	→	⊗	2.5
20	79		●	2.0
21	73		⊗	3x
22	95		⊗	
23	33		○	
			○	100 m



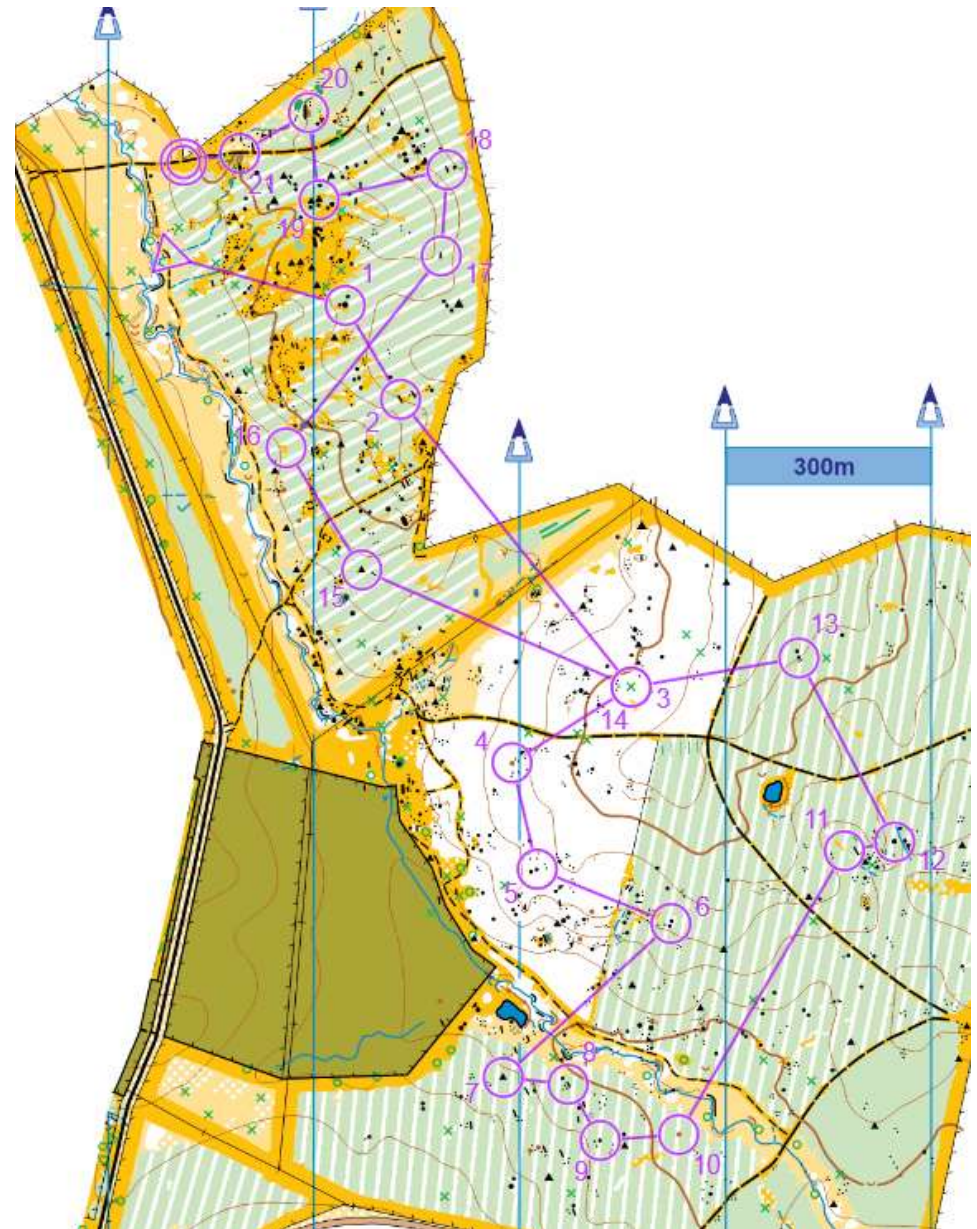
R
R

- LEGEND**
- Contour
 - Index contour
 - Form line
 - Earth bank
 - Earth wall
 - Knolls
 - Small knoll, elongated
 - Depression
 - Small depression
 - Pit
 - Impassable cliffs
 - Cliffs / rockfaces
 - Rocky pit
 - Boulders
 - Boulder field
 - Boulder clusters
 - Stony ground
 - Bare rock
 - Public road
 - Roads & tracks

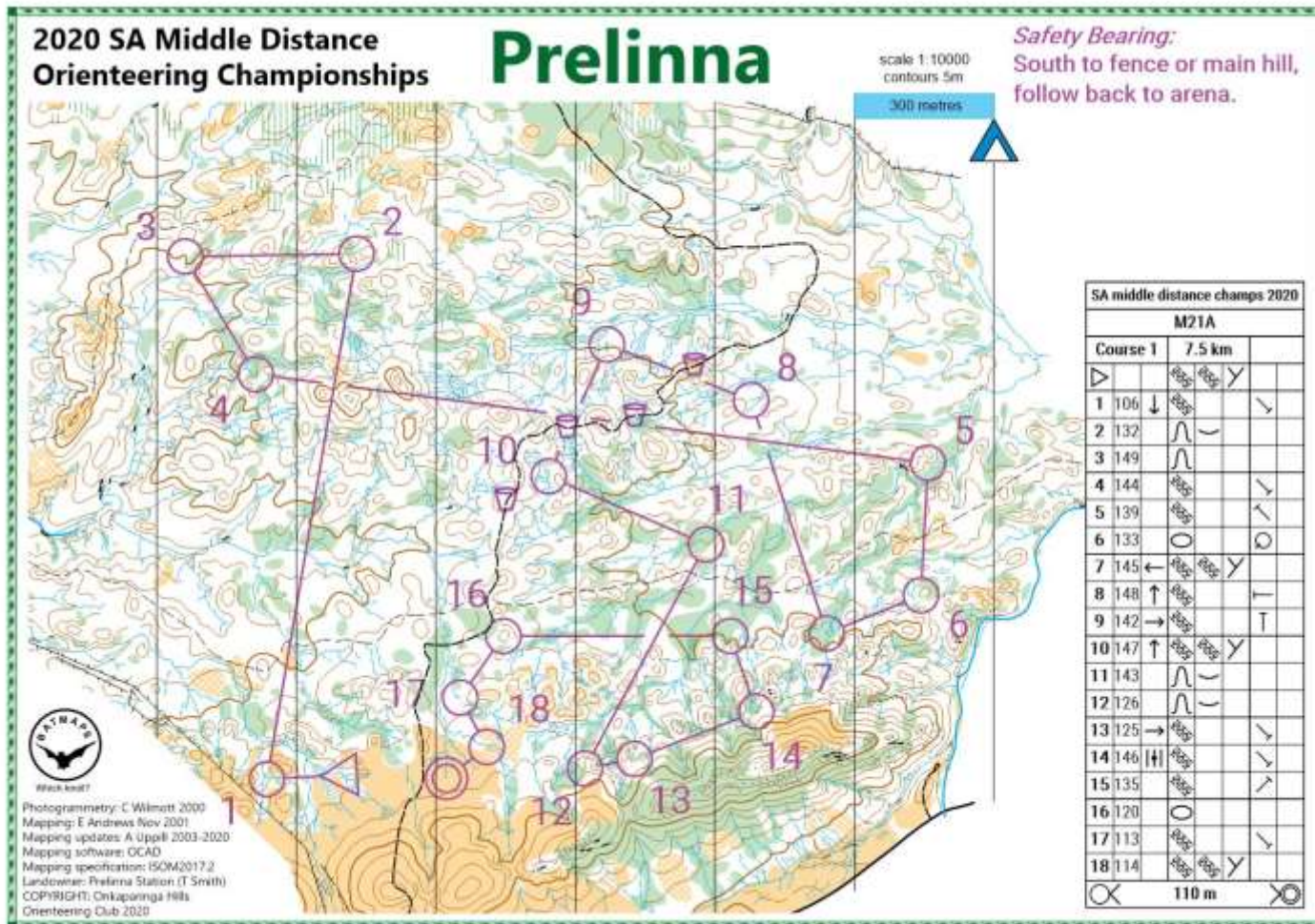
- Farm dam
- Waterhole
- Watercourses

SA Middle Distance 2019

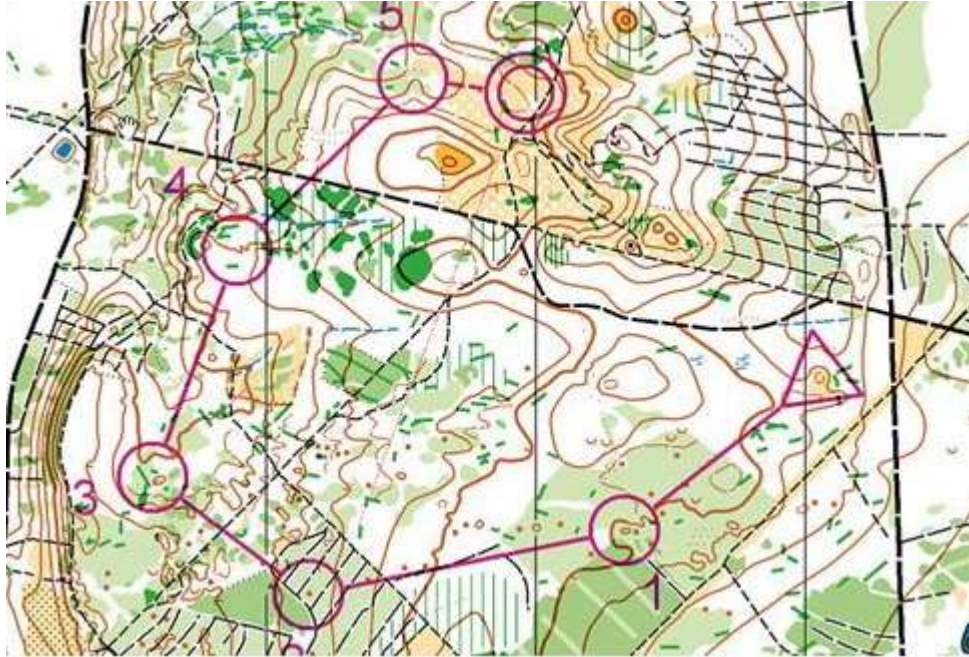
- Technical orienteering
- Concentration required for most of the course
- Direction changes
- Varied legs
- Accuracy required close to the controls



Middle Distance – Excellent Technical course



Less Technical Example



Examples that do not fully meet the requirements

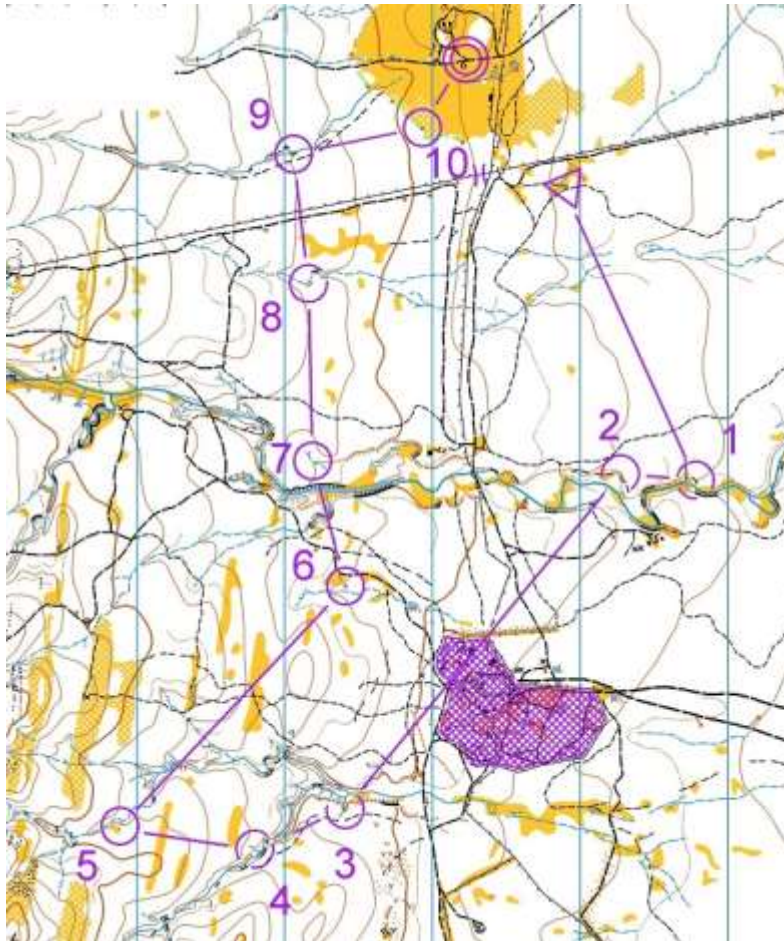
European Example –

Insufficient change in angle.

Insufficient difference in length of legs.

Note that the single legs may be acceptable, but the course is not

Middle Distance Example



- Spur Gully Example = Length 4.2 km
 - Meets some requirements – various leg length
 - Limited changes in direction e.g. controls 6 – 9 are all in the same direction
 - Could have made better use of the more technical areas of the map

More on Planning legs – short and medium legs

➤ Medium legs

- Often form the majority of courses, especially the shorter courses
- Need some route choice, although may be minor
 - Often based on choice of approach
- Control site difficulty is important

➤ Short legs

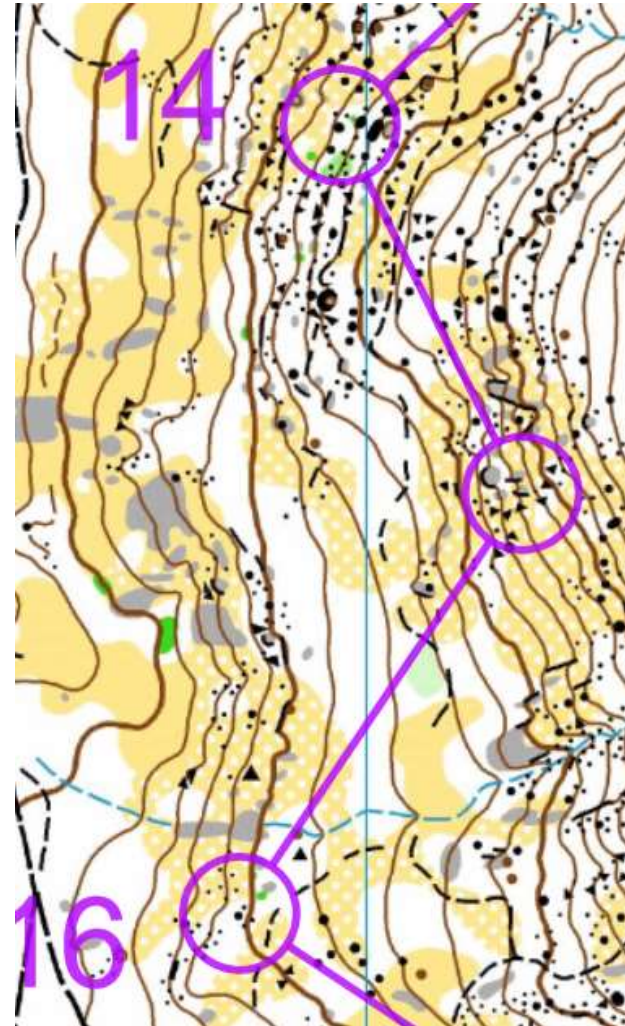
- Generally no major route choice – “straight is great”
 - Route choice options generally about optimising speed, ie: around a very rocky area
- Control site difficulty vital

More on Planning legs – short and medium legs

- What makes a control site difficult?
 - Low visibility, due to vegetation or obscuring features (ie: shallow gully in an area of large rock) – but be careful if the area is too vague
 - Legs which are diagonal to linear features, especially downhill – difficult to use linear features/simplify
 - Downhill in general
 - Lack of big obvious features or many similar features – hard to simplify
 - Have to use multiple techniques or features – point to point orienteering
 - No catching feature
 - Ideally can only see flag once at the feature – make the orienteer look for the feature, not the flag

Downhill and Diagonal legs

But map features are available near the Control to assist if you are on “course”



Reminder on Control Sites

- Controls must be placed at features in the terrain that are marked on the map. This demands careful planning and checking to ensure fairness.
- It is particularly important that the map portrays the ground accurately in the vicinity of the controls, and that the direction and distances from all possible angles of approach are correct.
- Competitor should be able to see the control when they are at the described feature/position – e.g. if in a gully do not try and hide behind a bush or log!
- Value of a good leg is lost if the control is poorly placed leading to a treasure hunt and a searching pack of runners, first runners there are often disadvantaged.

Reminder on Control Sites 2

- Don't try and make controls more difficult than the description suggests e.g. using a bush to "hide" a control in an open gully – reduces level of fairness as control visibility varies depending on approach direction
- Controls should not be sited on small features visible only from a short distance if there are no other supporting features on the map (esp. in green areas).
- Controls must not be sited where the visibility of the control flag for runners coming from different directions cannot be evaluated from the map or control description.
- Don't place controls in a maze of illegible detail or in very green areas
- Controls are not technically difficult because they are hidden
- Controls mark beginning and end of leg – also used for other purposes e.g. crossing points, water control, spectator points

Sprint Distance Format

- Profile is high speed (for runners)
- Commonly urban
- Tests ability to read complex maps and make route choice decisions quickly and implement them at high speed
- Map scale is 1:4,000, ISSprOM 2019 map specification
- Enlargement to 1:3,000 permitted for older age groups
- Controls are technically easy – but make competitors check for inside/outside corner scenarios
- Aim is to test the ability to choose and complete the best route, some apparent routes may have “traps” (dead ends or impassable objects)!
- But avoid areas so complex that they can’t be interpreted at speed
- Out of bounds areas and features not to be crossed need to be considered in course planning, don’t set legs that encourage these to be crossed, tape off where necessary

Sprint – Other Points

- The length of sprint courses is generally not measured as the distance between control points as in forest and recreational orienteering, but is measured as the optimum or most likely route, and so represents the actual distance to be covered.
- Winning times are in the range 12 – 15 mins, although when only a limited number of courses are offered, the time will probably be longer for most “running” participants
- As the events are most commonly in urban locations, safety considerations are important e.g.
 - Roads with traffic – can be marked as out of bounds, and where they need to be crossed require the use of designated crossing points e.g. underpasses need to be highlighted
 - Don't encourage routes that may lead to participants encountering high walls at speed
- Controls should not be sited within 25 metres of each other measured as running distance for map scales of 1:4000 and 1:3000, and a minimum straight line distance of 15 m

ISSprOM – selected symbols

Remind competitors in the event information and at the start of the Forbidden Areas and Features

Features that shall not be entered or crossed



Uncrossable body of water



Uncrossable marsh



Impassable cliff



Impassable fence



Impassable wall



Prominant line feature ie pipe



Uncrossable vegetation ie garden bed



Uncrossable vegetation ie hedge



Out of bounds area (purple over black)



Out of bounds boundary (purple under black)



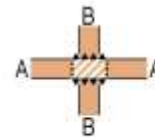
Building



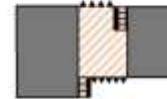
Closed area ie side-walk cafe



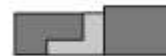
Railway line with Olive green line



Passable at two levels:
Over bridge upper level / brown stripe, A - A
Triangle line shows access to
lower level / white stripe, under bridge B - B



Passable at two levels:
Using stairs to access upper level / brown stripe
Triangle line shows access to lower level / white stripe



Canopy between buildings
Passable under canopy



Step or edge of paved areas

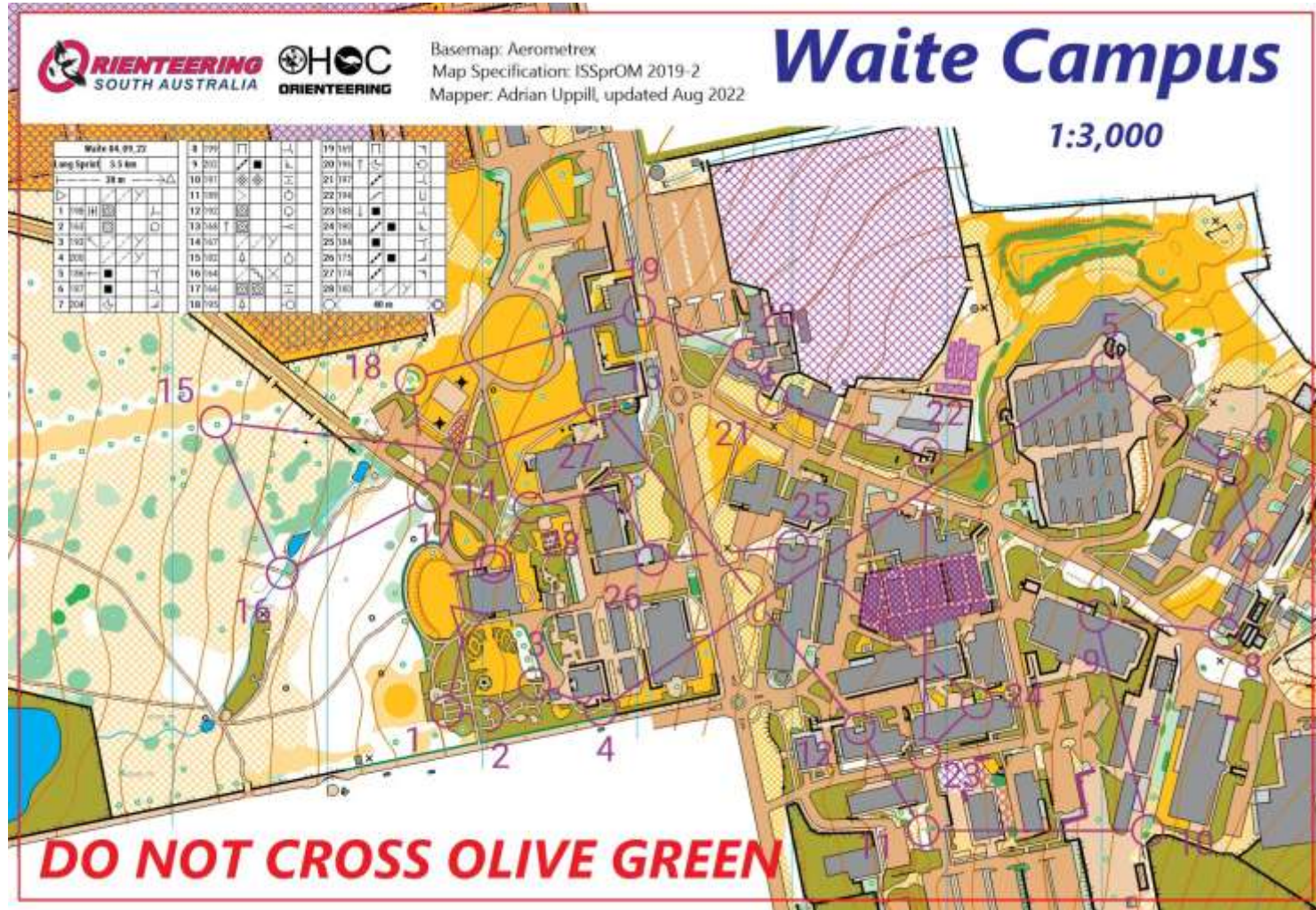


A paved area with scattered trees



Permitted access along a Track through
an area that shall not be entered (Olive green)

Local example – variety of legs and technical requirements



Sprint Distance Example – Spectator Legs, Map Exchange, Simpler Map, Temporary Barriers



4	120
5	130
6	135 ✓
7	150
8	134
9	133
10	144
11	74
12	126 ↑
13	127
14	109
15	102
16	106
17	108 ↖
18	112
19	71



23	110
24	121 ↓
25	115
26	140 ✓
27	138 ←
28	119
29	200

Sprint Course Example - European

16:45:00 RT 24 ms

INTERNATIONAL ORIENTEERING FEDERATION

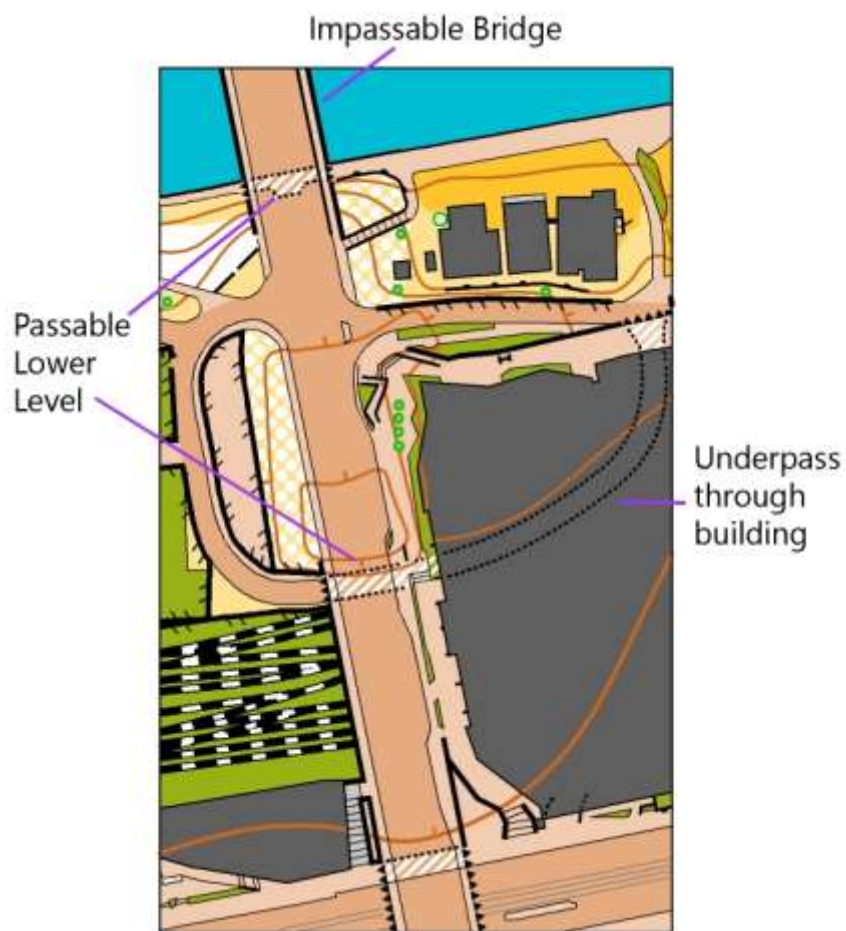
SVENSK ORIENTERING

WOC 2016 sprint final

	Men	4,1 km	100 m
1	101	⊗	⊗
2	102	⊗	⊗
3	103	→ ⊕	⊗
4	123	⊗	⊗
5	113	◇	⊗
6	105	◇	⊗
7	106	◇	⊗
120 m			
8	108	▽	⊗
9	109	↗	⊗
10	111	↖	⊗
11	122	⊗	⊗
12	107	→ ⊕	⊗
13	104	■	⊗
14	115	⊗	⊗
15	112	↗	⊗
16	110	↖	⊗
17	117	→ ⊕	⊗
18	114	⊗	⊗
19	118	← ⊕	⊗
20	119	← ⊕	⊗
21	124	↓ ⊕	⊗
22	100	⊗	⊗

Map and course information
Course setter: Göran Olsson

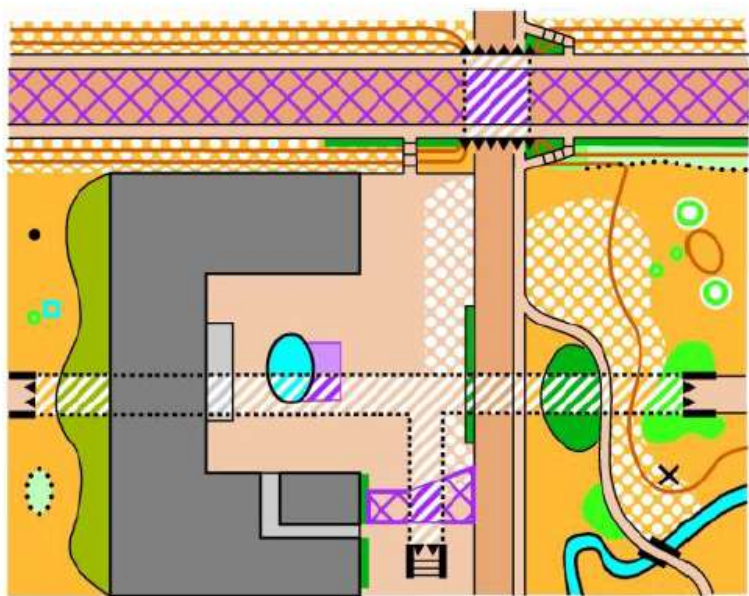
Sprint – Multi-level and Canopies



- Sprint maps may show features that are passable at 2 levels, this is illustrated in the following diagram where the roadway can be crossed at the top level (although this is a high traffic road) and also at a lower level, as shown by the striped area on part of the road.
- The triangles at each end indicate that the lower level is passable under the road here (passable bridge), with the line of small black dots showing the passable area under the road.
- These dots also indicate underpasses beneath buildings. A solid thicker line adjacent to the road indicates an impassable bridge.
- Striped area can indicate passable lower levels underneath other features besides paved or roadway areas as above. The above is the most common type you will see. For all possible combinations, see this page in the OMap WIKI - <https://omapwiki.orienteering.sport/symbols/512-3-area-passable-at-two-levels/>

Multi-level in Sprint Maps – more examples

- Refer to
- Guidelines for complex urban structures 2022-01-23.pdf
- On IOF web site here -
<https://orienteering.sport/iof/mapping/>

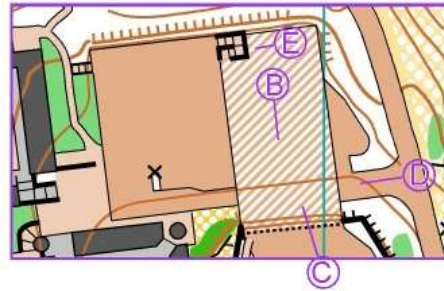


Map symbol 512.3 Area passable at two levels is the redefinition and renumbering of map symbol 501.2 Paved area in multilevel structures which was first published in ISSprOM 2019 first version. Over the last two years it was proven that the symbol works well and also in combination with some other area symbols. The use of the symbol is now extended but applies only for two-level situations. The edges of area objects mapped as uncrossable (411 and 520) should be highlighted with a thin black line (e.g. by 415, 501.1 or the edge for 520) in case of overlap with map symbol 512.3.

Sprint – multi-levels and canopies



Illustration 2 Carpark: Multi level & underpass symbols



Competitors need to be able to understand what is passable and what is not.

Don't set too many "tricks"



What makes a good sprint course

- Good terrain – small “granularity”
- Planning encourages high concentration
- Maximise route choices in each leg
- Minimise the ease of seeing best route choice
- Don't have too few control points
- Maximise direction changes
- Avoid long legs unless they have very high quality

Maximise the assessment score

Sprint Course Assessment

- 4 point scale for each leg

Points	Urban	Non Urban
0	Little or no route choice	Simple leg with minimal navigation needed
1	Two similar routes, easy to identify	Easy route choice leg with little technical detail
2	Several possible routes, or one longer route which is complex to execute – thinking needed	Route choices not immediately obvious and/or some technical challenge
3	Complex route choice/detailed navigation needed – many decision points	Complex route choice/detailed navigation needed

But not every leg needs to be a 3.

New Sprint Formats

Some fun and training events have used this format in SA

- Sprint Relay
 - Official format is a team of 4, 2 men and 2 women
 - OSA Club Relays in urban terrain is a variation on this
- Knockout Sprint (see OA Foot Rules for more details)
 - profile is an individual multiple-round high-speed competition with head-to-head racing in all but the first round.
 - takes place in an urban and park environment.
 - parallel heats with an interval start to qualify for the knock-out section.
 - one or more knock-out rounds with several parallel heats and mass starts where the leading runners qualify for the next round.
 - single mass start race to determine the winner.

Controls – Duplicate and Butterflies

- Revisit a control on a course – when is this appropriate
 - Useful for spectator controls – e.g. may be the same as the Finish control or part of a run through (long courses, sprint with a small map)
 - Drinks control site
 - Mandatory crossing point joining two sections of a map across a road or similar
 - May mean competitors approach and leave controls on opposing directions – so you see outgoing runner on an approach
- Butterflies and Loops
 - Not necessary for SA only individual events – for the competitor numbers on any course
 - Adds complications – as courses and maps need to be individually assigned

Relay Format - Forest

- Team competition
- Mixture of technical difficulties
- As for all courses – consider the age groups on a course
- Elements of Middle and Long – route choice allows separation of runners
- Forking – but ensure fairness
 - Can get quite complex!
- Last part of legs generally common
- Spectator friendly
- Enjoyable for competitors

2018 AUSTRALIAN ORIENTEERING CHAMPIONSHIPS SA



Wiela / Bunyip Reach

Australian Relay Championships



be active.



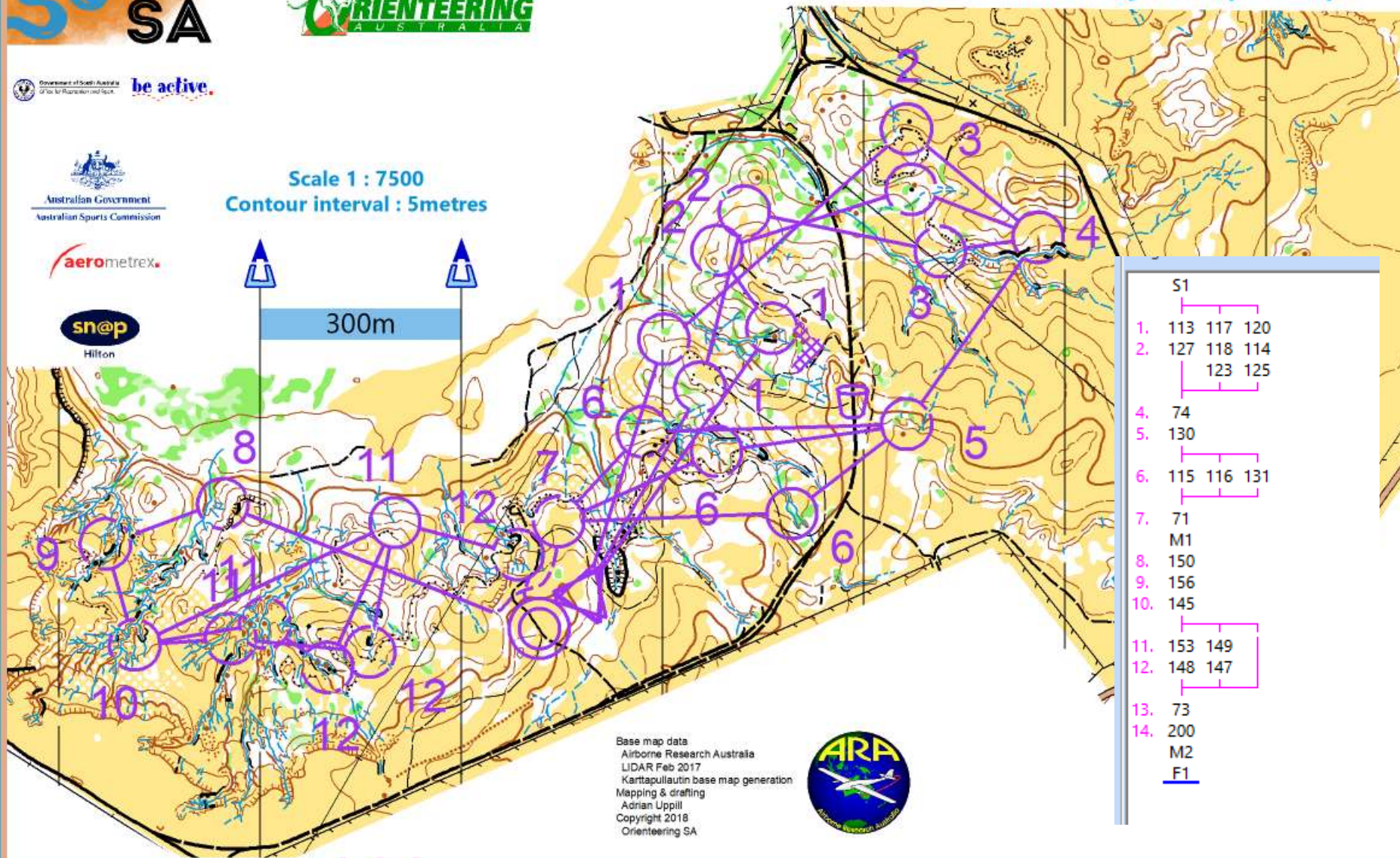
Australian Government
Australian Sports Commission



Scale 1 : 7500
Contour interval : 5metres



300m



S1	
1.	113 117 120
2.	127 118 114 123 125
4.	74
5.	130
6.	115 116 131
7.	71
M1	
8.	150
9.	156
10.	145
11.	153 149
12.	148 147
13.	73
14.	200
M2	
F1	

Base map data
Airborne Research Australia
LIDAR Feb 2017
Kartapullautin base map generation
Mapping & drafting
Adrian Uppill
Copyright 2018
Orienteering SA



Other Variations

Street – Park

- Elements of all formats depending on the map
- Route choice should be the primary focus with elements of Middle/Sprint if map permits
- Navigation limited to Very Easy to Moderate
- Out of Bounds and Un-crossable Features – don't encourage these to be crossed
- Traffic and Major Roads – minimise crossings
- Security of Control sites, but don't hide controls
- Friendly assembly area

Blackwood Park



Blackwood Twilight 2020

3 Long **5.8 km** **180 m**

Start	End	Description
Start		
1	170	Man-made feature
2	175	S side of middle lone tree
3	172	S side of man-made feature
4	177	E end of fence
5	178	E side of stone wall
6	180	NE side of lone tree
7	163	E end of fence
8	162	E end of minor watercourse
9	164	Minor watercourse
10	163	E end of fence
11	169	Bridge
12	174	E side of thicket
13	163	E end of fence
14	161	S end of fence
15	179	W foot of cliff
16	167	S side of lone tree
17	166	Road junction

Navigate 230 m to finish



Base map : Blackwood Hills Orienteering Map 2019, ISOM2017
 Field work & Cartography: AO Uppill Oct 2011 - 2019
 Ownership & Copyright : Onkaparinga Hills Orienteering Club Inc. 2020

Other Variations

Night Courses

- Long distance style but over shorter distance
- Safety considerations important, navigational standards generally reduced

Score/Scatter

- Format closest to Long
- Dependent on map areas

Common Mistakes - General

- No route choice on the more difficult courses
- Course lacks variety
- Course unnecessarily physical for age groups concerned - do not equate technical and physical difficulty
- Older age groups like a technical challenge but not overdo the physical challenge
- Climb is excessive – or gratuitous climb – climb up just to go down again
- Lost distance - no navigation needed over most of the legs
- Dog legs are present or different courses approach the same control in opposite directions, can eliminate a dog leg by adding an extra control
- Map scale was wrong in setup so course distance is wrong
- Degree of navigational difficulty is not correct
- Did not plan water controls early

Common Mistakes - Controls

- Control site confusing because of errors in map, unmapped details (what is in the circle must be correct)
- Control description incomplete
- Control flag is hidden to attempt to make control site harder
- Course has not been checked for running feasibility or hazards
- Misplaced controls, incorrect control number = the death of an otherwise good course
- Control circle not centred correctly – should be centred on point objects or for area symbols on the defined location

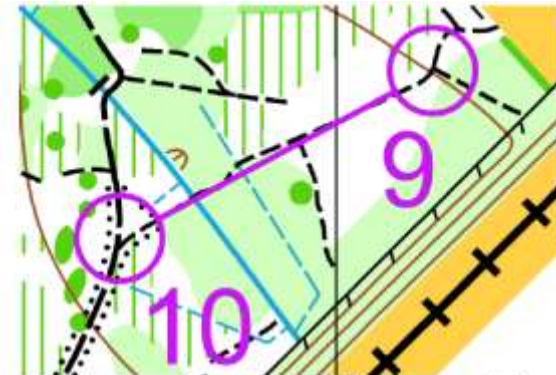
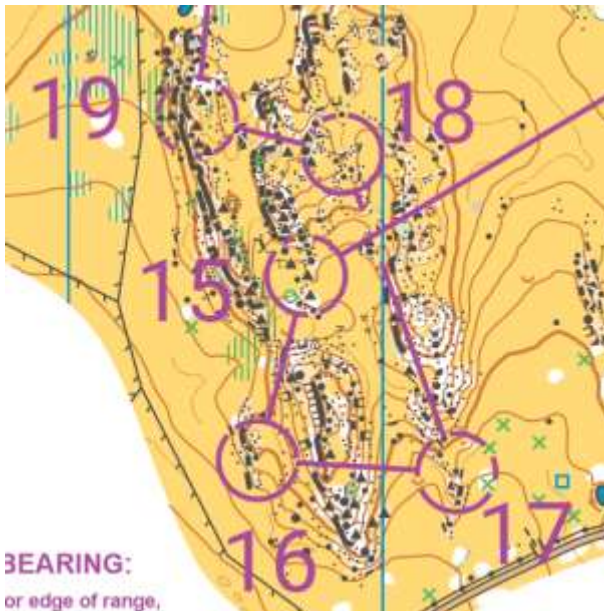
Other things to consider

- 3 or more controls in a straight line – are the middle ones needed?
- Course has many legs of similar length
- Avoid legs where competitors are tempted to cross out of bounds areas
- Don't choose a control feature as a control site just because it is "good" or interesting, but does not enable good legs

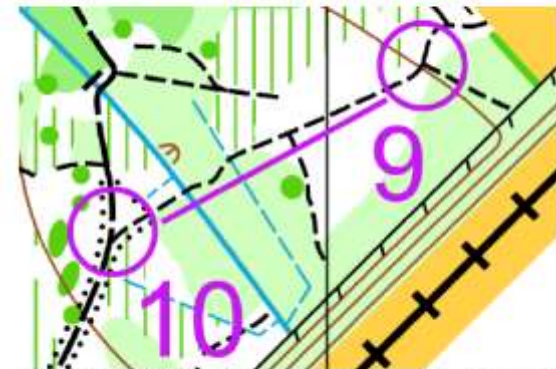
Common Mistakes – Examples - Forest

Course overprinting

- Circles and lines obscure details
- Cut circles to show detail
- Cut lines where they cross, or cross a circle

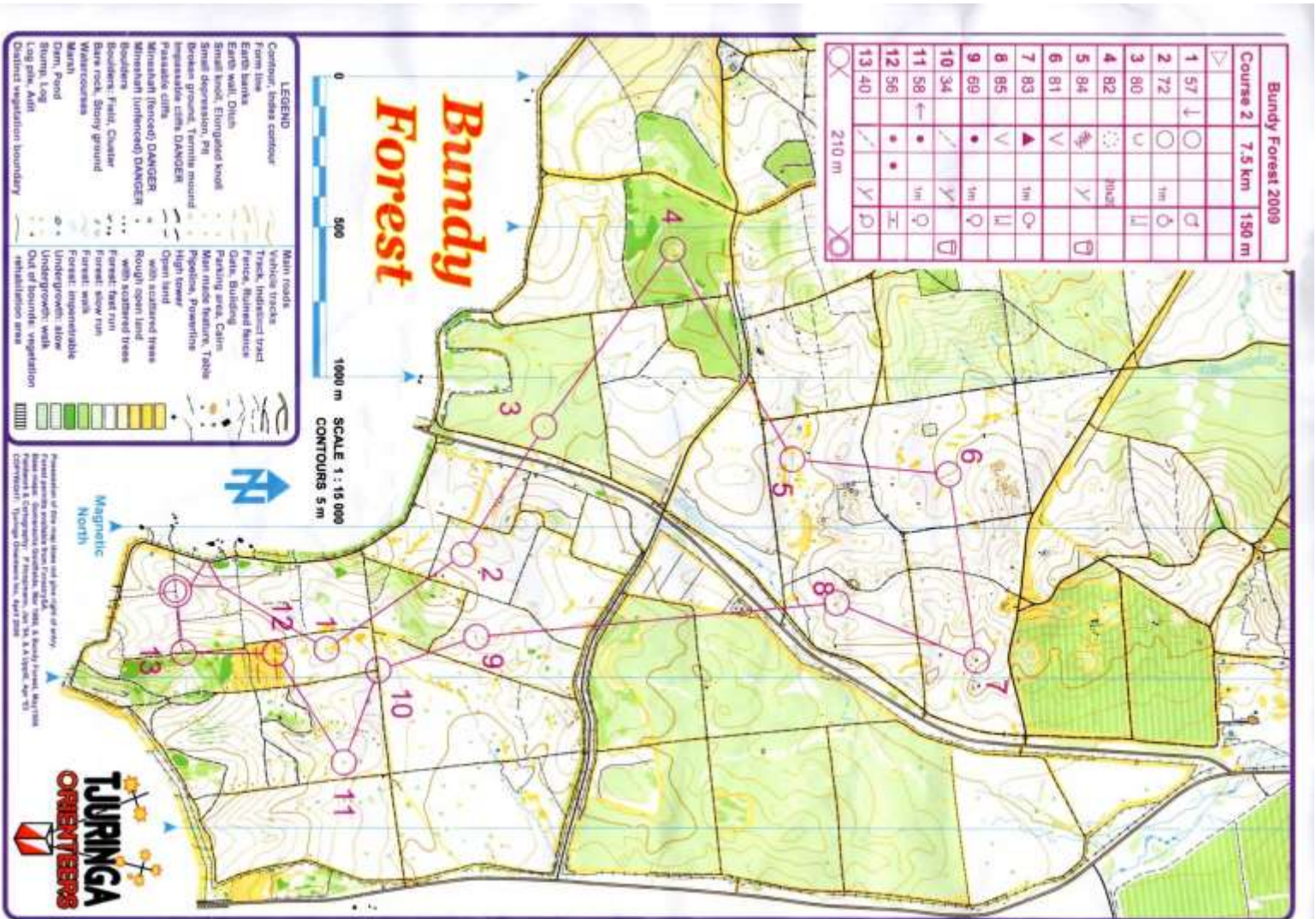


Map10 : Poor overprint - red line obscures path.



Map11 : Edited overprint - with the red line now offset the path becomes clearly visible.

Frequent catching features mid leg or before the control – avoid this



Planning legs – short and medium legs

- Things to avoid
 - Using the obvious/big/unique feature
 - Using features on the edge of the detail
 - Linear features parallel to leg
 - Bingo/vague
 - Unfairness
 - Control visibility
 - Only one approach
 - Attachment to a site/feature which can compromise the leg
 - Easy feature mid leg – especially important to avoid having these on consecutive legs



Problems

- Map quality
- Map issues
- Tempting participants to cross forbidden areas or dangerous areas



Determining Course Length

- Aim is to determine the course length to meet the expected winning time (refer to OSA Course Specifications and OA Foot Rules)
- Difficult for courses that have a range of classes and expected abilities to get the winning times correct for all classes
- Course specification introduction has some reference data
- Previous events on the area also provide reference material
- Factors influencing relative run rates
 - Style of orienteering – long, middle, sprint
 - Navigation standard – hard, mod, easy, very easy (calculation for the last 3 is difficult, recommended distance may be more useful for Easy and Very Easy)
 - Terrain – open vs green, steepness, obstacles (small, large)
 - Level of competition, depth of field
 - Sprint – consider the actual running distance

Determining Course Length

Age Class Event Example

- Winning time for M60A is 50 mins
- Relative Speed to M21A for the class is 0.62
- M21A run rate is 5.1 min /km
- M60A course length = $50 / (5.1/0.62) = 6.07$ km
- i.e. winning time / mins per km for the age class
- Because multiple age classes are on one course, you will need to average the required distance for each class for that course
- For more physical terrain (steeper, rougher), older age classes become relatively slower compared to younger

OSA Guidelines

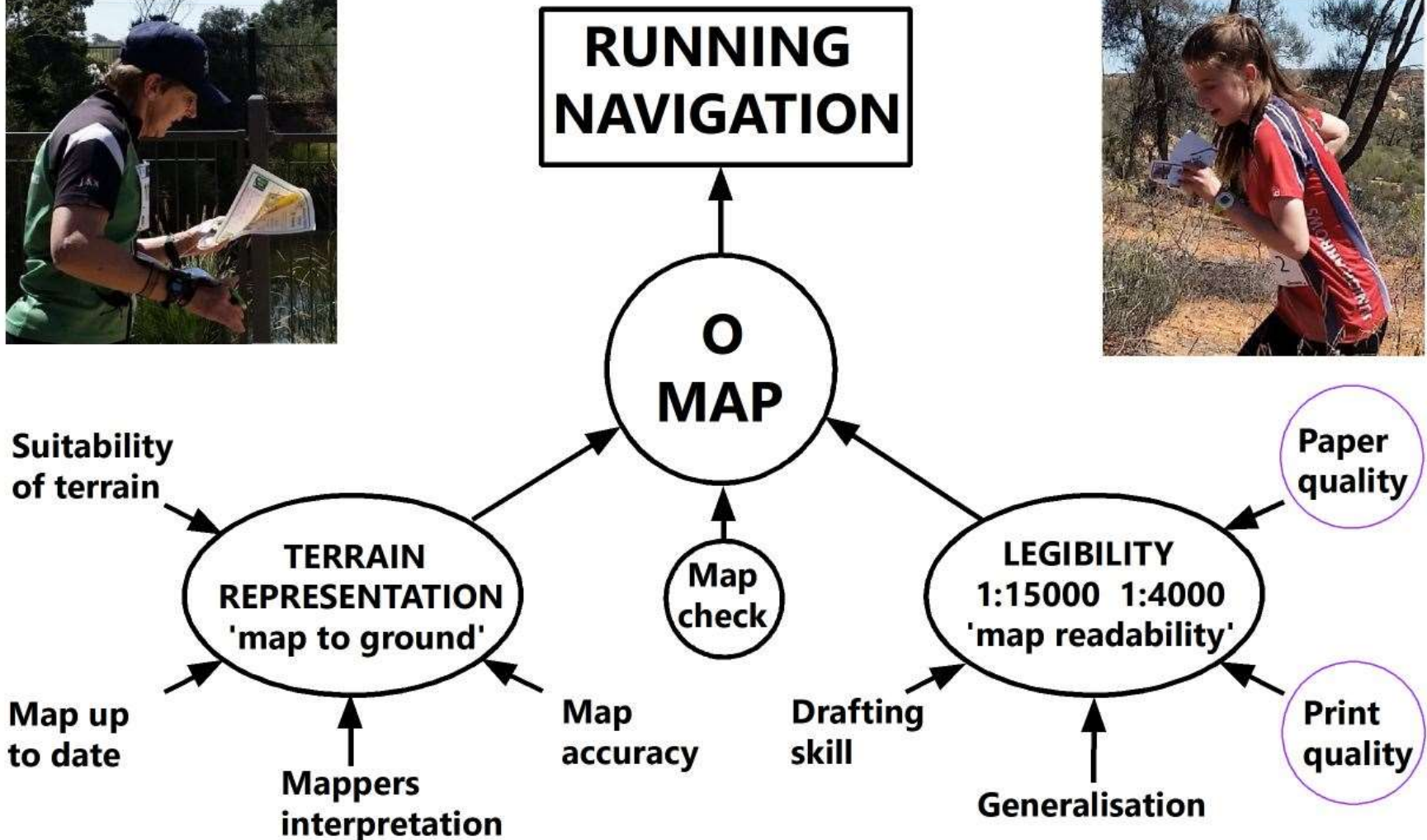
Course Specifications

- Available on the OSA Web site at
- <http://sa.orienteering.asn.au/admin/OASAGuidelinesPolicies/>
- Cover the required courses for each type of event. For OY and above, defines the age classes for each course

Also on this page

- Safety Guidelines
- Link to OA Foot Orienteering rules
- Link to Control Description documents

Overview in respect to map printing



Printing and colour

Colour order in mapping software

- The order of printing colours are set for each mapping specification ie forest, sprint, ski, mountain bike
- Colour order is becoming more complex ie point feature and area feature of the same colour may have two positions on the colour table
- Do not mess with the colour order!

Paper

- Laser printing requires good quality white paper for colour laser printing with a weight of 100 – 110gms per square meter
Plastic bag thickness ~ 100 microns
- Plastic paper to have a smooth surface and suitable folding capability

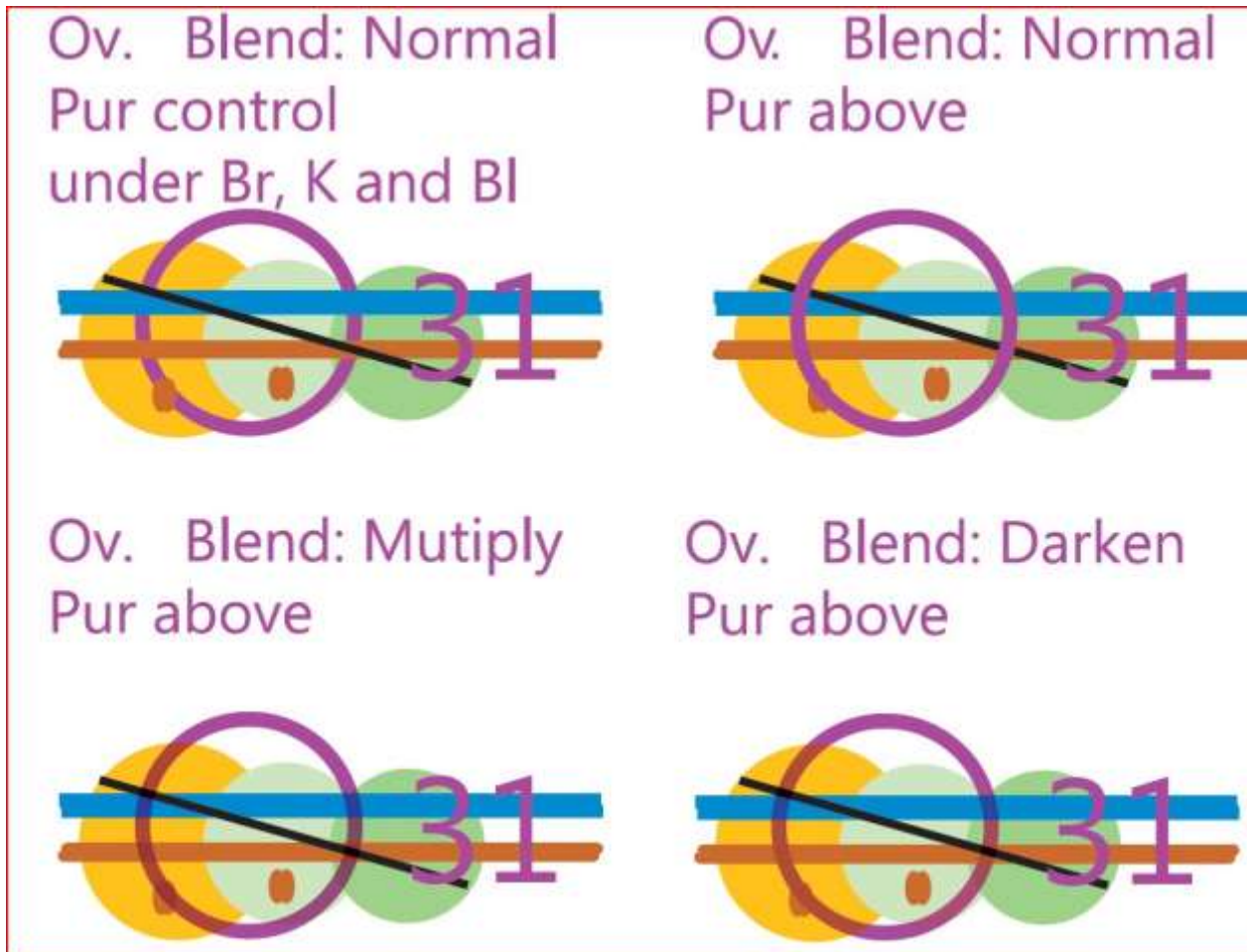
Printing and colour

Course planning symbols

- Courses were once 'Overprinted' with Purple which appeared transparent over the map.
- Laser printing requires the transparent effect to be simulated by placing the Purple track colour below certain map colours as per colour order for orienteering maps.
 - More advanced methods to achieve overprint such as 'Blending' is not recommended because this can impede the effort to print a map with high resolution and also can create confusing other colours due to the overlapping of colours.
 - Currently only OCAD can simulate transparency of placing the Purple track colour under certain map colours. It requires the map file to be merged with the Course file.

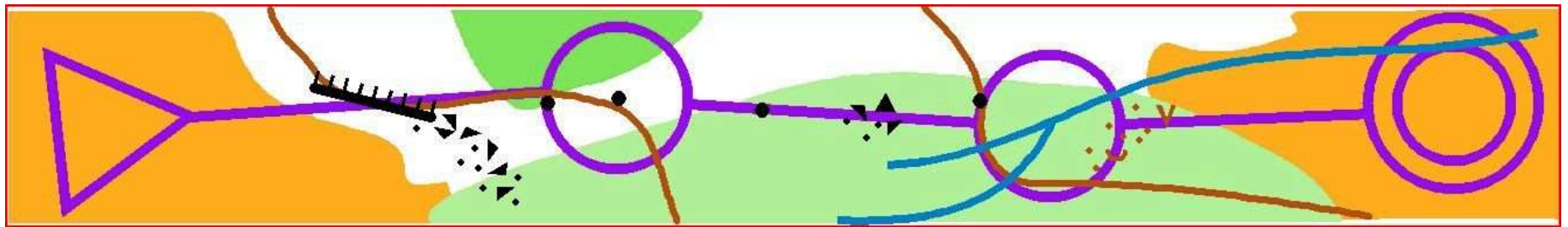
Printing and colour

Course printing: Comparison of Under, On top and Blending

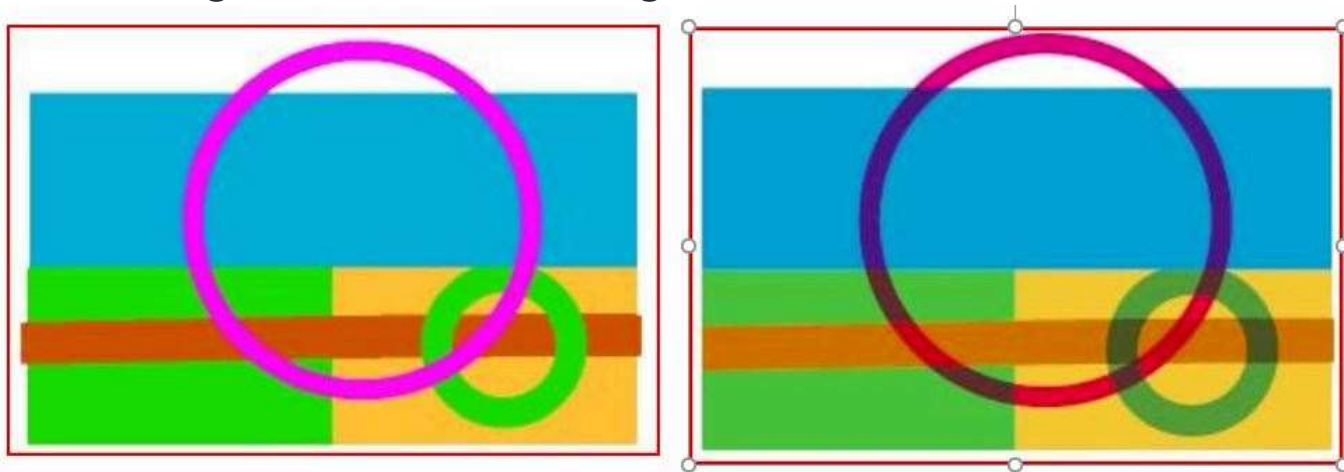


Printing and colour

Even with simulation best to cut connection lines and control circles as required. Example shows Purple under Black, Brown and Blue



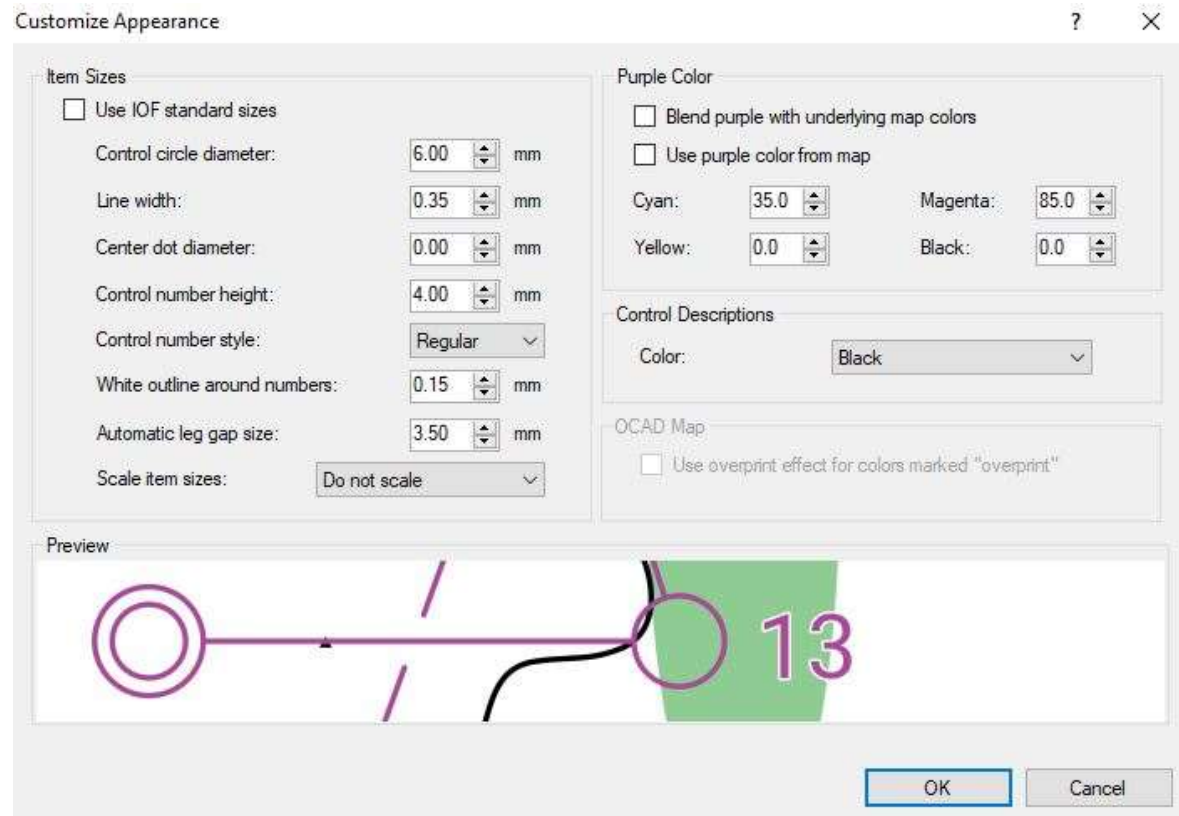
Blending creates confusing third colours



Printing and colour

Purple Pen course marking set up

- Purple CMYK 35 85 00 00
- Blending unchecked ie blank
- White outline to numbers
- Control circle diameter:
5mm ISOM (1:15,000)
6mm ISSprOM (1:4,000)



Printing and colour

OCAD course marking set up

- Change Blend mode to Normal for all colours (for PDF export)

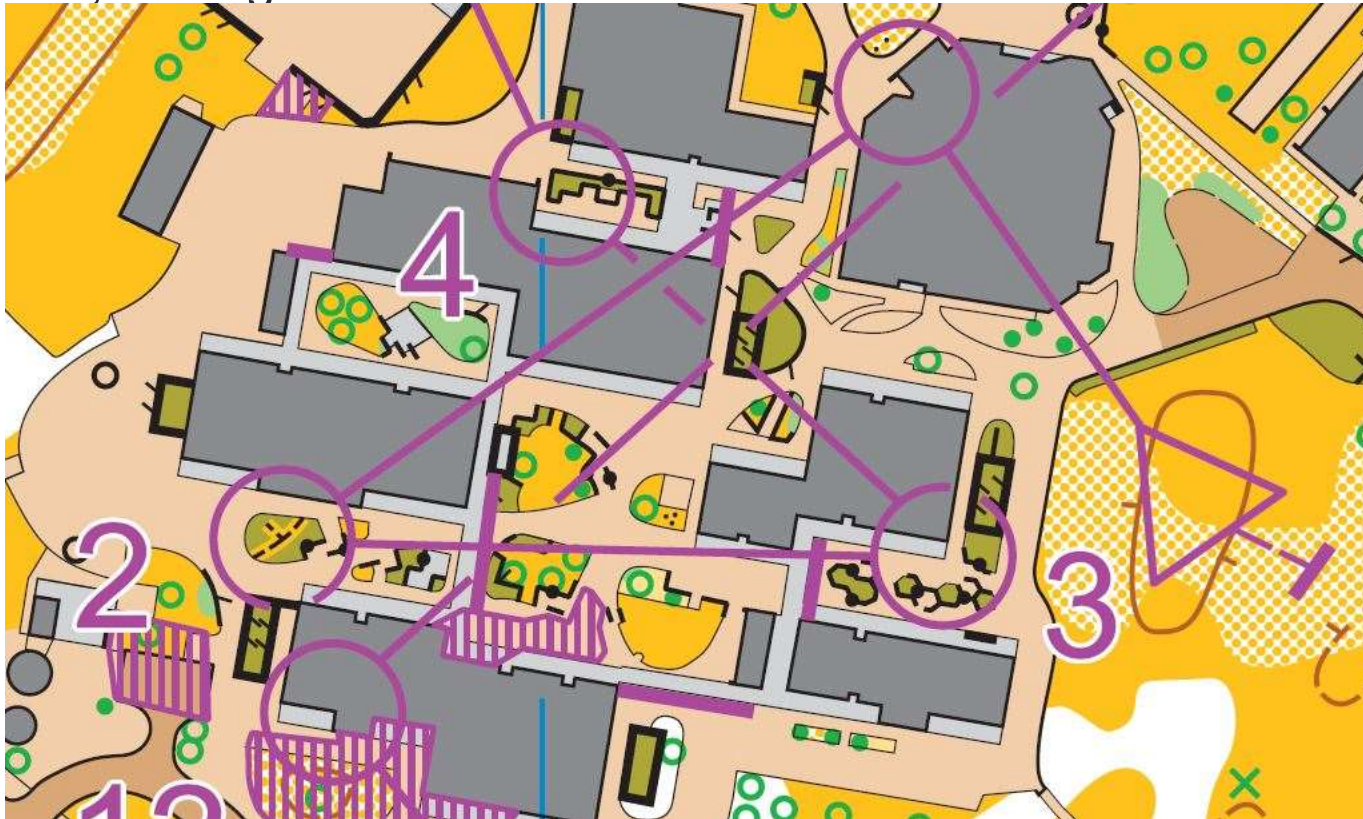
The screenshot shows the OCAD software interface with a color table and a 'Blend mode' dialog box. The color table lists various colors with their CMYK values and blend modes. The dialog box shows the same table with 'Blend mode' set to 'Darken' for several colors.

No.	Name	CMYK (process) colors [%]					Ov.	Opacity	Symbols	Map
		Cyan	Magenta	Yellow	Black					
50	Upper Purple for Course Overprint	35	85	0	0	✓	100	✓	✓	
51	White for Course Overprint	0	0	0	0		100	✓	✓	
1	All printing colours	100	100	100	100		100			
2	Black 100%	0	0	0	100	✓	100			
52	Lower Purple for Course Overprint	35	85	0	0	✓	100			
4	Blue 100% - Point Feature	100	0	0	0		100			
5	Brown 100% - Point Feature	0	56	100	18	✓	100			
6	Green 100% - Point Feature	76	0	91	0	✓	100			
7	Black 100% - Street Middleline	0	0	0	100	✓	100			
8	Brown 50% - Street Infill	0	28	50	9		100			
9	White for Railway	0	0	0	0		100			
10	Black 100% - Street	0	0	0	100	✓	100			
3	Blue 100% - North Line	100	0	0	0	✓	100		Darken	
11	Black 65% - Area Feature	0	0	0	65		100		Normal	
12	Black 20% - Area Feature	0	0	0	20		100		Normal	
13	Green 100% + 50% Black Line Feature	76	0	91	50	✓	100		Normal	

Printing and colour

Example: Aust Sprint Champs, Renmark Schools 2018

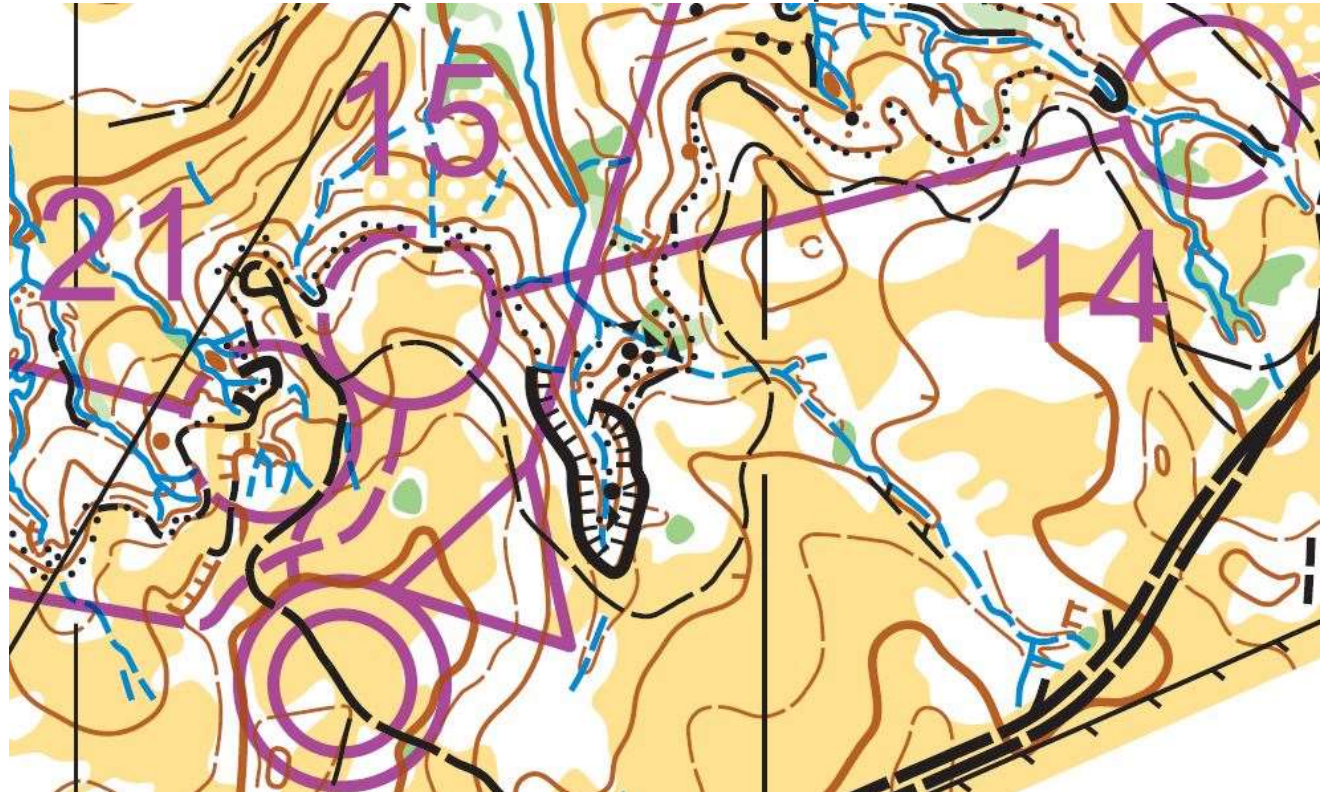
- OCAD: No blending, Purple on top of all colours, White border to control numbers, cutting of lines & circles as needed



Printing and colour

Example: Aust Relay Champs at Wiela / Bunyip Reach 2018

- OCAD Blending 'on' for lines & circles. No attempt to cut connection lines as too many leg variations
- OCAD Blending 'off' for control numbers and on top of all colours

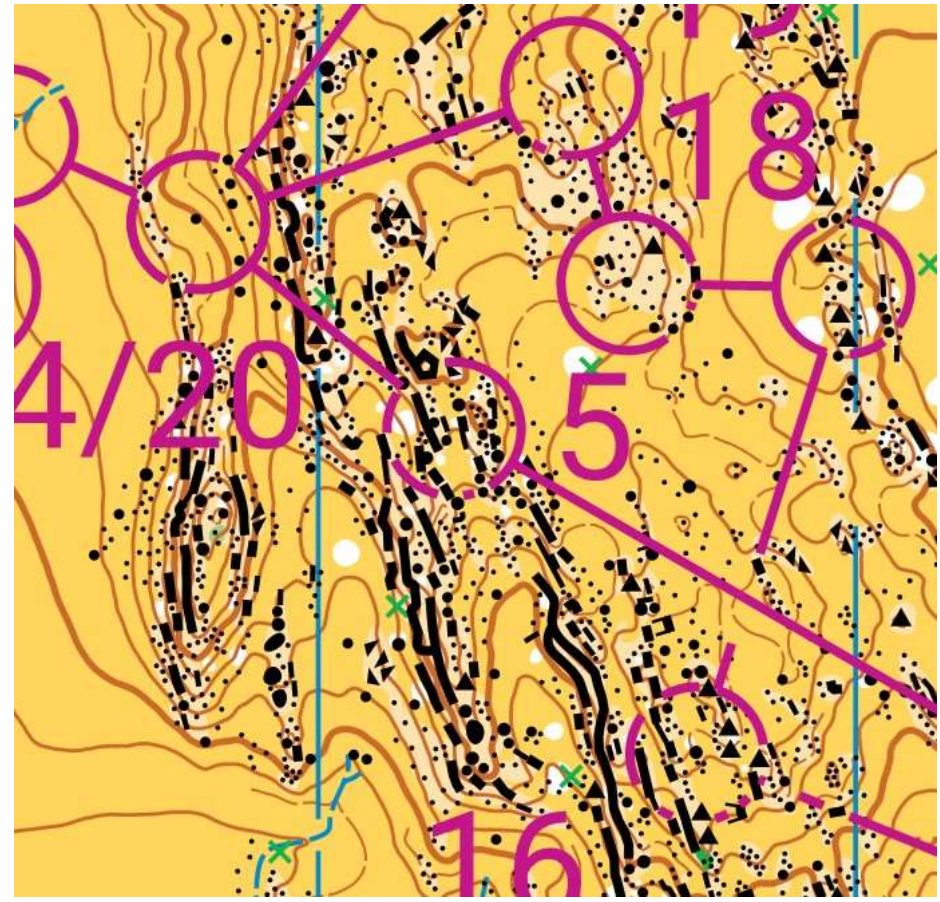
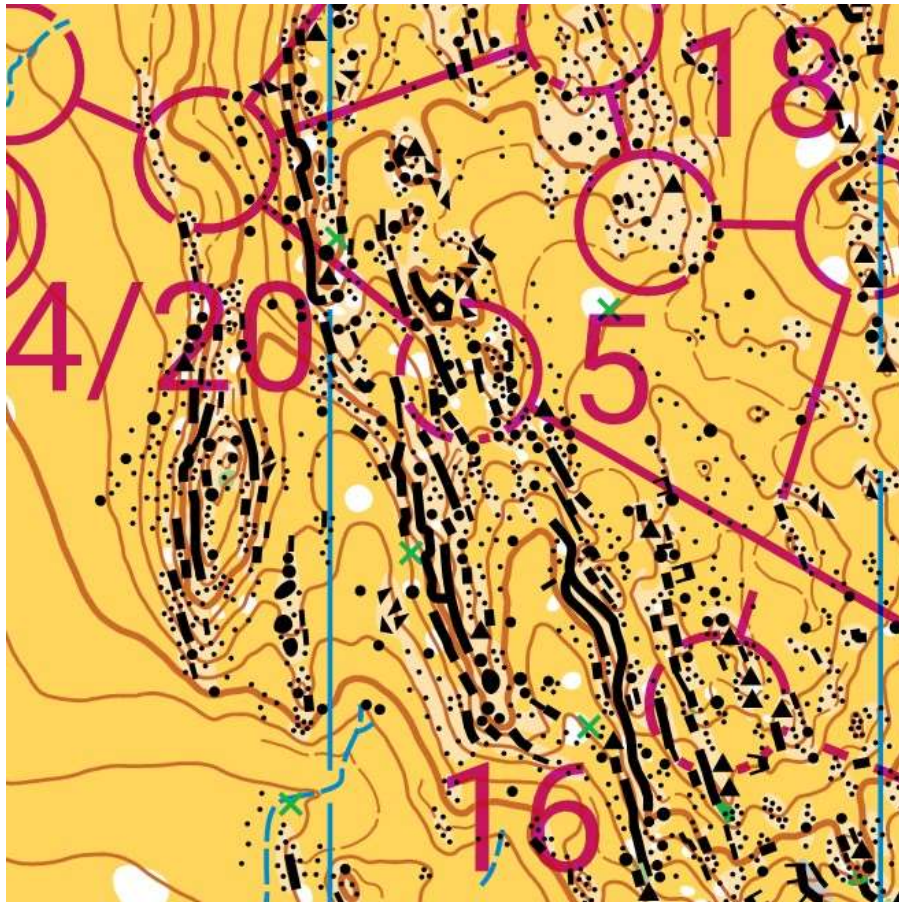


Printing and colour

Example: Aust Middle Distance Champs at Keynes Gap 2018

Purple Pen: LHS Blending 'On' RHS Blending 'Off'

Controller and Course Planner were given this choice – so which one?

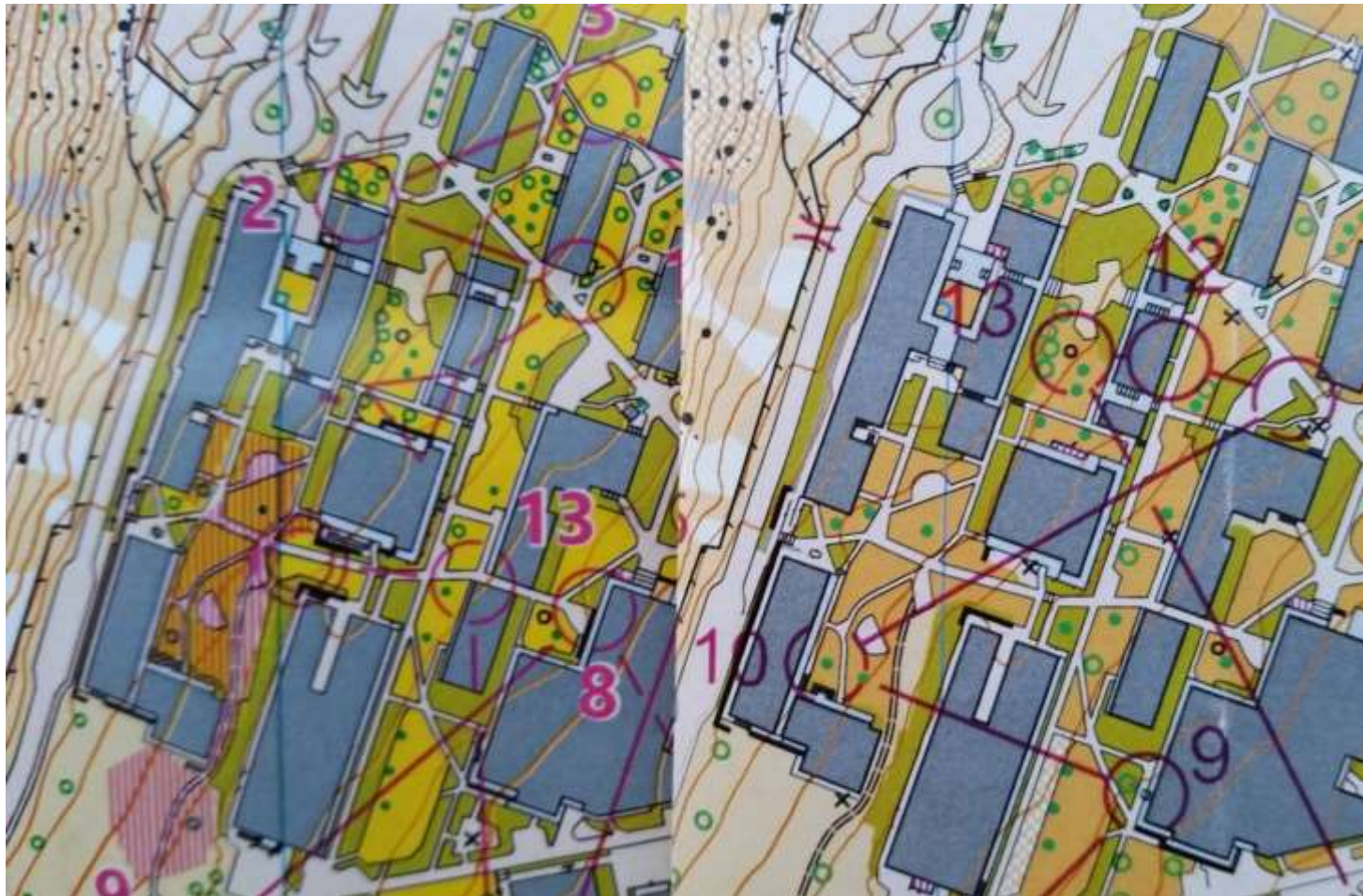


Map Printing and Course Marking, AO Uppill, March 2020

Printing and colour – this is why you need to do test prints!

Print quality: Wagga Wagga University

LHS Aust Sprint Champs 2019 - a fail! RHS Aust 3 Day 2017



References

This presentation and other documents are published here

<https://www.sa.orienteering.asn.au/about-us/technical-information>

A longer version of the Map Printing document is available there also