



MEASUREMENT REPORT

SERBIAN NATIONAL RACE WALKING CHAMPIONSHIPS

by Borut Podgornik AIMS/IAAF course measurer

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SUMMARY OF MEASUREMENT SERBIAN NATIONAL RACE WALKING CHAMPIONSHIPS

Date of measurement: 25. 3. 2019

How many measurements of the course were made? 2

Name of measurer: Borut Podgornik

How much of the road width is available to runners throughout the length of the road race course?

Always right side of the road is available to walkers on the whole course, divided with fences and cones in the middle of the road and cones at the arcs.

If the route at turns cannot be described as the "shortest possible route", explain what restrictions will apply, and how these will be enforced?

The course was measured as the shortest possible route on the right half of the roads inside The Nautic Village »Biser« all the way.

Length of course after any adjustment: 1.000,01m

Difference between longest and shortest measurement: /

Which measurement was used to establish the final course length and WHY?

The final course length of the course was established after bicycle postcalibration with this additional measurement on the 3rd turn, so this turn was designed so that the course lenght is correct.

OVERVIEW OF THE MEASUREMENT PROCEDURE

Athletic Federation of Serbia will organize 63rd National Championships in race walking. The date of the event is Sunday, 7th April with first start at 12.00. There will be some different lenghts of the races ranged between 1km and 5km, depends on age category. Approximate number of participants in all starts will be around 50-60.

The organizer is Athletic club Surčin and they decided to put the course inside tha Nautical Village »Biser« area very close to the Sava river near the village of Boljevci, cca 25km away from Belgrade. They will have a lap of 1000,00 m to walk out and back with one turning point (see picture 9). The roads where the course is lying on is app. 4 m wide with exception on the turns where it is wider. It is with tarmac underground all the way. The difference between lowest and highest point is 5m although the course looks like very flat. Start/finish is at 76m.

I have found an appropriate road for calibration course on the road Obrenovački put in the village Boljevci (see pictures 1 to 5). The calibration course is app. 300 m away from the start, so easy to reach. Bicycle calibration was done before and after the measurement as a standard procedure on this course.

The measurement of the course was quite simple. First I fixed 1st turn (see pictures 8, 9 and 17) in the manner that there is enough space also for walkers at 4th turn (coridor of 2m for 4th turn and 2,70m for 1st turn) with PK nail in the road. Then I made also the same at the 2nd bend (see picture 10). Then I ride a bike in the walking direction from the start always on the right half of the road. The first measurement was 870,52m long, so quite shorter then necessary (for 129,48m). That's why I made 2 more rides at the 3rd bend (first on the basic route to take into account that distance), then around the island on shortest possible way. I have got the distance 116,40m (still 13,08m too short). Then I designed the course there more left in walking direction out (for 7,60m at the point where the turn begins – see picture 7) and got this additional 13,08m more. See data sheet below. Then I marked all this exposed points with PK nails, made postcalibration of the bike, then made a new ride on the whole course and got the correct distance. Then I made all necessary photos and measured the distances from nearby landmarks. The organizer shall provide a separation in the middle of the whole course because two way of walking with fences and cones + all arcs in bends and turns with cones as in attached photos.

DETAIL OF THE CALIBRATION COURSE

- 1 Name of event: Serbian National Race Walking Championships
- 2 City/town: Boljevci near Surčin, Serbia

3 Location of calibration course: on the left side along Obrenovački put (Obrenovac road) in the village of Boljevci towards Surčin, start parallel 1,46 m right from traffic sign »Priority Road« and 2,63 m diagonal before telephone pole on the left side, 12,04 m diagonal from Electricity pole on the other side of the street (see pictures 1 to 3), finish 13,55 m diagonal after 2nd to last light pole on the right side of the road, 10,08 m diagonal before traffic sign towards Surčin on the right side of the road (see pictures 4 and 5).

- 4 Length of calibration course: 300,00m
- 5 Date measured: 25. 3. 2019
- 6 Method used to measure calibration course: 50m steel tape (20°C, 50N)
- 7 How many times did you measure the calibration course? 2x
- 8 Measurement team leader: Borut Podgornik
- 9 Address of team leader: Staneta Severja 14, 2000 Maribor, Slovenia
- 10 Phone contact of team leader: +386 41 664412
- 11 Email address of team leader: borut.podgornik@triera.net
- 12 List names and duties of team members: Helena Javornik, assistant
- 13 Is the calibration course: STRAIGHT? YES PAVED? YES
- 14 How are the start and finish points marked? PK nails

15 Are the start and finish points located in the road where a bicycle wheel can touch them? YES

- 16 Number of full tape lengths 6 Total length: 6 x 50m = 300m
- 17 A picture of calibration course (not far away from the course):



STEEL TAPING DATA SHEET (for measuring a calibration course)

Name of calibration course: Obrenovački put in Boljevci

City/town and State: Boljevci near Surčin, Serbia

Date: 25. 3. 2019

Start time: 6.00 Finish time: 6.40

Pavement temperature:Start4°CFinish4°CAverage4°C(thermometer shaded from direct sun)

Measurements and calculations:

1 First measurement. This establishes tentative start and finish marks which should not be changed until the final adjustment on line 6 below.

6 x 50,00m + / = 300,00m # tape distance per partial tape measured lengths tape length length distance

2 Second measurement. This checks the distance between the SAME tentative start and finish points marked in the first measurement, but use new intermediate taping points.

6	х	50,00m	+ / =	300,000m
# tape		distance per	partial tap	e measured
lengths		tape length	length	distance

3 Average raw (uncorrected) measurement of course: 300,000m

Temperature correction. Use the average pavement temperature during measurement. Work out answer to at least seven digits beyond the decimal point.
Correction factor = 1.0000000 + (.0000116 x [4 - 20])
Correction factor = 0,9998144
NOTE: For temperatures below 20C, factor is less than one
For temperatures above 20C, factor is greater than one

- 5 Multiply the temperature correction factor by the average raw measurement of the course 0,9998144 x 300,000m = 299,94432 correction factor avg. raw measurement corrected measurement
- 6 I moved the finish mark for 5,6 cm onwards and drive PK nail into the road.

Final (adjusted) length of calibration course 300,00m

BICYCLE CALIBRATION DATA SHEET

Name of event: Serbian National Race Walking Championships

Date of measurement: 25. 3. 2019

Name of measurer: Borut Podgornik

Length of calibration course: 300,00m

PRE-CALIBRATION - ride the calibration course four times, recording data as follows:

Ride	Start Count	Finish count	Difference
1	21000	24296	3296
2	24296	27592	3296
3	27592	30888	3296
4	30888	34184	3296

Time of day: 6.50 Temperature: 5°C

WORKING CONSTANT = number of counts in one kilometre, calculated from the pre-measurement average count, and multiplied by 1.001 – the "short course prevention factor"

Pre-measurement average count = 3296

Counts per km = pre-measurement average count x 1000/length of calibration course in metres Working Constant = counts per km x 1.001 = **10.997,653333333**

POST-CALIBRATION - ride the calibration course four times, recording data as follows:

Ride	Start Count	Finish count	Difference	
1	77000	80296	3296	
2	80296	83591,5	3295,5	
3	83591,5	86886,5	3295	
4	86886,5	90182	3295,5	

Time of day: 8.00 Temperature: 8°C

FINISH CONSTANT = number of counts in one kilometre, calculated from the post-measurement average count, and multiplied by 1.001 – the "short course prevention factor"

Post-measurement average count = 3295,5

Counts per km = post-measurement average count x 1000/length of calibration course in metres

Finish Constant = counts per km x 1.001 = 10.995,985

CONSTANT FOR THE DAY = the average of the working constant and the finish constant = **10.996,819166666**

COURSE MEASUREMENT DATA SHEET

Name of event: Serbian National Race Walking Championships

Name of measurer: Borut Podgornik

Date of measurement: 25. 3. 2019

Start time: 7.15 Temperature: 8°C

Finish time: 8.15 Temperature: 9°C

Constant for the Day: 10.996,819166666 counts/km

MEASUREMENT DATA

Measured point	Counter	Cumulative	Cumulative	Adjustment
	reading	counts	distance in	in m
			m	
Start – 7,65 m before 2nd to last concrete	38000	00000	0,0	/
electricity pole on the right side of the way				
just before reception of the village on the				
left side – see picture 6				
Start/finish – as above	47573	9573	870,52	/
1 = nail - see picture 7	50000	00000	0,0	/
2 = nail – see picture 7 - basic	50850	850	77,29	
1 = nail - see picture 7	51000	00000	0,0	/
2 = nail – see picture 7 – 1st adjustment	53130	2130	193,69	
1 = nail - see picture 7	54000	00000	0,0	
2 = nail – see picture 7 – 2nd adjustment	56274	2274	206,78	
Start – 7,65 m before 2nd to last concrete	60000	00000	0,0	/
electricity pole on the right side of the way				
just before reception of the village on the				
left side – see picture 6				
Start/finish – as above	70997	10997	1000,01	/

Desired length of course: 1,000km

Length of the course as measured (after postkalibration): 870,52 m Length of the course as measured (after postkalibration and 2nd adjustment of 3rd bend): 1000,01 m

CALIBRATION COURSE START – (picture 1)



CALIBRATION COURSE START BACKWARDS – (picture 2)



CALIBRATION COURSE START SIDE VIEW – (picture 3)



CALIBRATION COURSE FINISH – (picture 4)



CALIBRATION COURSE FINISH BACKWARDS – (picture 5)



START – (picture 6)



POINTS 1 and 2 IN 3rd BEND – (picture 7)



1st TURN – (picture 8)



1st TURN – (picture 9)



2nd BEND – (picture 10)



2nd BEND – (picture 11)



TOWARDS 3rd BEND – (picture 12)



3rd BEND - (picture 13)



3rd BEND – (picture 14)



TOWARDS 4th TURN – (picture 15)



4th TURN – (picture 16)



1st and 4th TURN – (picture 17)





THE COURSE - (picture 19)



ELEVATION PROFILE - (picture 20)



OFFICIAL FLYER – (picture 21)



Maribor, 26th March 2019

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