MEASUREMENT REPORT

APATIN DANUBE HALFMARATHON

(Apatinski Dunavski polumaraton)

(remeasurement)

by Borut Podgornik
AIMS/WA course measurer

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SUMMARY OF MEASUREMENT DANUBE HALFMARATHON

Date of measurement: 15. 4. 2026

How many measurements of the course were made? 1

Name of measurer: Borut Podgornik

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

Entire width of the roads is available to runners on the whole course except at roundabout near Banja Junaković spa, where only right side of the road (when running second part of the race) is available to run (see descriptions with pictures below).

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 roads with exceptions above where the measurement was done only to the middle of the road on the right side.

Length of course after any adjustment: 21.097,50 m, 10.000,00 m

Difference between longest and shortest measurement: /

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

The final length of the course was established after bicycle postcalibration and moving the turning point 1 onwards for 66,68 m to get the correct lenght (see data sheet below). The difference occurs because the start/finish was removed to a new position, which is more convenient for runners.

OVERVIEW OF THE MEASUREMENT PROCEDURE

Apatin Danube halfmarathon is a traditional event, this year organized already for 30th time. The organizer is a local Athletic club AK Apatin. The course was already official measured before and had a certificate, but expired this year. Beside halfmarathon there is also a 10km race in a program. The date of the event for this year is Sunday, 18th October with start at 11.00 in the morning. There are 2 course distances in the same event as I mentioned before: 10km and halfmarathon with the same start and finish (new!!!) not far away from the front of entrance to Banja Junaković Spa near Apatin, but different turning points on the same course. Approximate number of participants will be around 1000 in both distances.

I have used the same calibration course as in previous measurement - on bicycle path along main road heading to Apatin from Banja Junaković Spa (pictures 1 to 5). Bicycle calibration was done before and after the measurement as a standard procedure on this course (see below).

The measurement of the course was very simple. I started at starting point not far away from the entrance to Banja Junaković Spa (see pictures 6 and 7) and made a ride with a bicycle in running direction on shortest possible route accompanied with a Police car in the front, sometimes on the back (depends on traffic situation) + another car of the organizer. During the measurement I made intermediate stops where I made marks and put down counter readings (provisional B and D). First I measured from the start to point B, then from this point back around the park in front of the entrance to the spa back to point B. Next step was a ride from point B over point D, already existed turn for 10km (nail!!!) all the way to halfmarathon turn (nail again). At all this intermediate points I wrote down counter readings. Next measurement was from point D around the roundabout (right side) to point B again. Next step was a ride from point B on shortest possible route to point C (nail again!!!), which was old Turn 1. At the end I calculated all the figures and found out that the halfmarathon is for 133,26 m too short, so we have to move provisional point C for half of this distance onwards to get the correct distance for halfmarathon (picture 16). Taking into account this additional extension I calculated also the distance for 10km and found out that the distance is correct too, which was easy to predict (see data sheet below).

At all importand points (= turns and separation) I also made all necessary photos (see in an appendix) and on pictures below I marked where the organizer should put fences and cones in order to prevent runners to take short cuts.

The course (see pictures 20 and 21) is on tarmac road all the way and flat - pictures 22 and 23, the difference between the lowest and the highest point is 4 m for 10km and 10 m for halfmarathon. Start and finish is at 84 m above sea level.

LIST OF THE STREETS AND ROADS FOR DANUBE HALFMARATHON

STREET BY STREET	KM	LINES AVAILABLE
Access road to Banja Junaković	**START**	full
Apatinski put	**1, 2**	full
Apatinski put - turn	**2,69**	full
Apatinski put	**3, 4**	full
Access road to Banja Junaković	**5, 6**	full
Dimitrije Tucovića	**7, 8, 9**	full
Marka Oreškovića		full
Srpskih vladara	**10**	full
Nikole Tesla Square		full
Dunavska	**11, 12, 13**	full
Dunavska - turn	**13,33**	full
Dunavska	**14, 15**	full
Nikole Tesla Square	**16**	full
Srpskih vladara		full
Marka Oreškovića	**17**	full
Dimitrije Tucovića	**18, 19, 20**	full
Access road to Banja Junaković	**21**	full
Access road to Banja Junaković	**FINISH**	full

LIST OF THE STREETS AND ROADS FOR 10km

STREET BY STREET	KM	LINES AVAILABLE
Access road to Banja Junaković	**START**	full
Apatinski put	**1, 2**	full
Apatinski put - turn	**2,69**	full
Apatinski put	**3, 4**	full
Access road to Banja Junaković	**5, 6**	full
Dimitrije Tucovića	**7**	full
Dimitrije Tucovića - turn	**7,8**	full
Dimitrije Tucovića	**8, 9**	full
Access road to Banja Junaković	**FINISH**	full

DETAIL OF THE CALIBRATION COURSE

1 Name of event: Danube halfmarathon

2 City/town: Apatin, Serbia

3 Location of calibration course: on bicycle path beside main road from Banja Junaković Spa to the city of Apatin, in W direction, start parallel to the far edge of electricity box on left side (2,90 m away), 4,41 m diagonal left before near edge of concrete ring around drain cover on the right side (see pictures 1 and 2), finish 28,62 m after far edge of wire fence around gas station on the right side (see pictures 3 to 5).

4 Length of calibration course: 300,00m

5 Date measured: 11. 8. 2022

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:

STEEL TAPING DATA SHEET (for measuring a calibration course)

Name of calibration course: bicycle path Banja Junaković Spa

City/town and State: Apatin, Serbia

Date: 11. 8. 2022

Start time: 18.05 Finish time: 19.00

Pavement temperature: Start 27°C Finish 27°C Average 27°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 lengths		distance per tape length		partial tape length		measured 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	x	50,00m	+	0,001m	=	300,001m
# tape lengths		distance per tape length		partial tape length		measured distance

3 Average raw (uncorrected) measurement of course: 300,0005m

4 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 [27 – 20])
Correction factor = 1,0000812
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

1,0000812	x	300,0005m	=	300,0248600406
correction factor		avg. raw measurement		corrected measurement

6 I moved the finish mark for 2,4 cm backwards and drive PK nail into the road.

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

BICYCLE CALIBRATION DATA SHEET

Name of event: Danube halfmarathon

Date of measurement : 15. 4. 2026

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	46000	49295	3295
2	49295	52590,5	3295,5
3	52590,5	55884	3293,5
4	55884	59178	3294

Time of day: 6.45 Temperature: 11°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 = 3294,5
Counts per km = pre-measurement average count x 1000/length of calibration course in metres
Working Constant = counts per km x 1.001 = **10.992,648333334**

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

Ride	***Start Count***	***Finish count***	***Difference***
1	92000	95295	3295
2	95295	98590	3295
3	98590	101884	3294
4	101884	105178	3294

Time of day: 9.10 Temperature: 13°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 = 3294,5

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

Finish Constant = counts per km x 1.001 = **10.992,648333334**

CONSTANT FOR THE DAY = the average of the working constant and the finish constant = **10.992,648333334**

COURSE MEASUREMENT DATA SHEET

Name of event: Danube halfmarathon

Name of measurer: Borut Podgornik

Date of measurement: 15. 4. 2026

Start time: 7.15 Temperature: 11°C

Finish time: 9.30 Temperature: 13°C

Constant for the Day: 10.992,648333334 counts/km

MEASUREMENT DATA

Measured point	Counter reading	Cumulative counts	Cumulative distance in m	Adjustment in m
Start – parallel to first light pole on the left side before road bends towards the entrance into Banja Junaković Spa – see pictures 6 and 7	68000	00000	0,00	/
Point B (provisional) on the road from Banja Junaković Spa to the roundabout on main road - see picture 8	73688	5688	517,43	/
Point B (provisional) on the road from Banja Junaković Spa to the roundabout on main road - see picture 8	74000	00000	0,00	/
Point B (provisional) on the road from Banja Junaković Spa to the roundabout on main road - see picture 8	87911	13911	1.265,48	/
Point D (provisional) on main road to Apatin - see picture 8	92806	18806	1.710,77	/
Turn for 10km – on Main road to Apatin, near entrance to MBP gas station on the right side, 12,00 m diagonal left from the last light pole on the right side – see pictures 9 to 11	106230	32230	2.931,95	/
Turn for halfmarathon, just before the access road to Town beach, 8,62 m diagonal right from signpost »Town beach« in the middle of the road – see pictures 12 and 13	167112	93112	8.470,38	/
Point D (provisional) on main road to Apatin - see picture 8	41000	00000	0,00	/

Point B (provisional) on the road from Banja Junaković Spa to the roundabout on main road - see picture 8	46349	5349	486,59	/
Point B (provisional) on the road from Banja Junaković Spa to the roundabout on main road - see picture 8	46000	00000	0,00	/
Point C (provisional) on the main road to village Prigrevica – see picture 16	69155	23155	2.106,40	+ 66,63
Point C (provisional) on the main road to village Prigrevica – see picture 16	69000	00000	0,00	/
New Turn 1 – parallel to steel electricity pole on the field left – see pictures 17 and 18	69733	733	66,68	/

RECAPITULATION OF MEASUREMENT

I. halfmarathon

desired length of the course: 21.097,50 m

measured course: 2 x (Start – point B) + (Point B – Turn for halfmarathon) + (Turn for halfmarathon – D) + (point D – Point B) + 2 x (point B – Point C) = 2 x 517,43 m + 8.470,38 m + 6.759,61 m + 486,59 m + 2 x (2.106,40 m) = 20.964,24 m (133,26 m missing)

We move provisional point C for half of this distance onwards = 66,68 m, which makes a total distance: **21.097,60 m (correct distance!)** - see picture 20

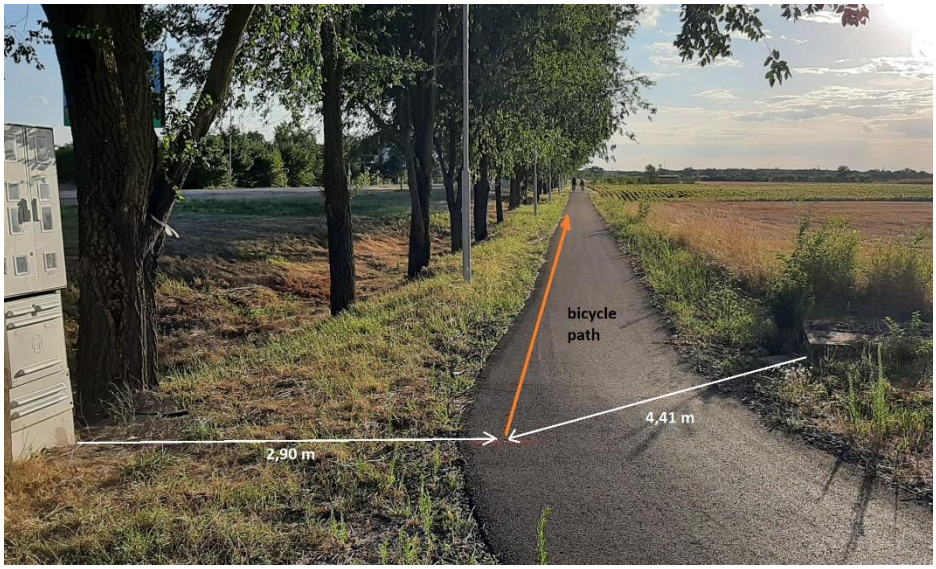
II. 10km

desired length of the course: 10.000,00 m

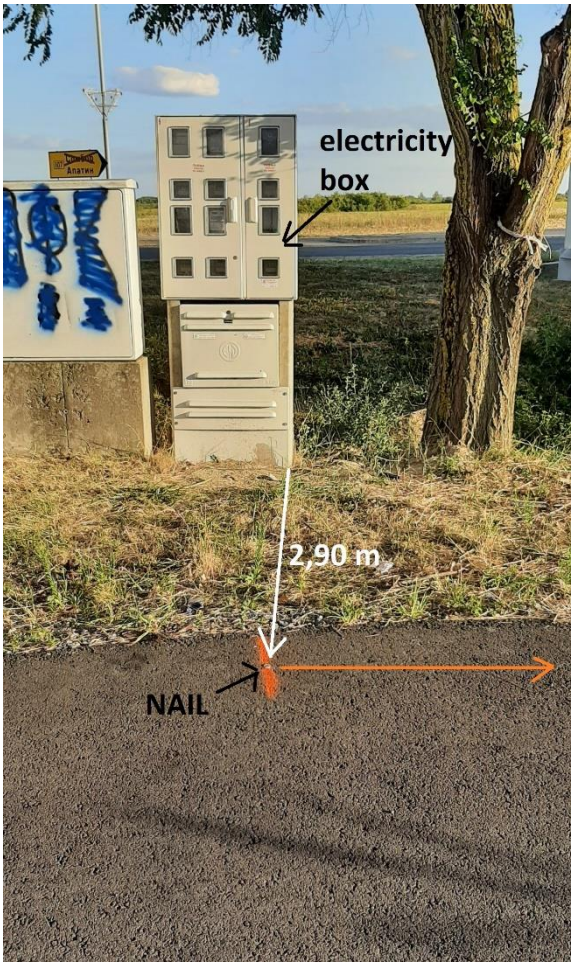
measured course: 2 x (Start – point B) + (Point B – Turn for 10km) + (Turn for 10km – D) + (point D – Point B) + 2 x (point B – Point C) = 2 x 517,43 m + 2.931,95 m + 1.221,18 m + 466,59 m + 2 x (2.106,40 m) = 9.867,38 m (132,62 m missing)

If we move provisional point C for 66,68 m onwards (see above), we get a correct distance of **10.000,74 m** - see picture 21

CALIBRATION COURSE START onwards – (picture 1)



CALIBRATION COURSE START side view – (picture 2)



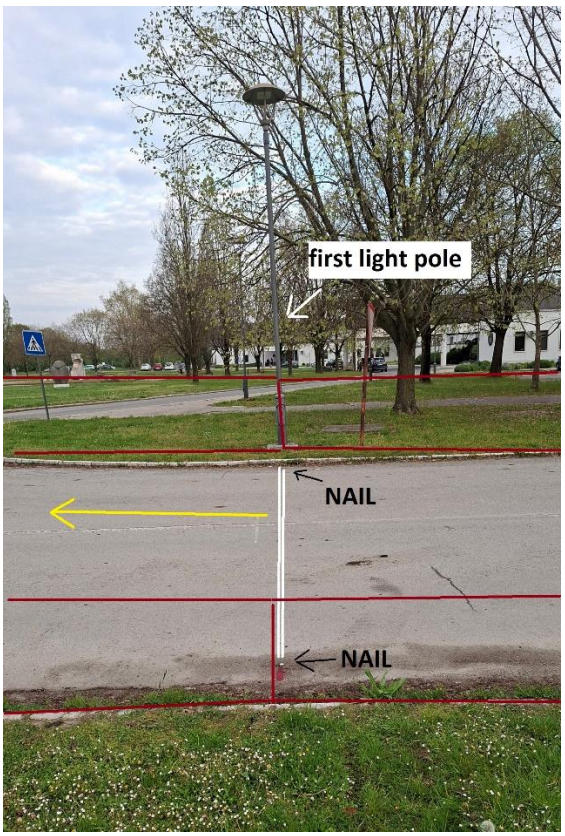
CALIBRATION COURSE FINISH backwards – (picture 3)

CALIBRATION COURSE FINISH side view – (picture 4)

CALIBRATION COURSE BEFORE FINISH onwards – (picture 5)

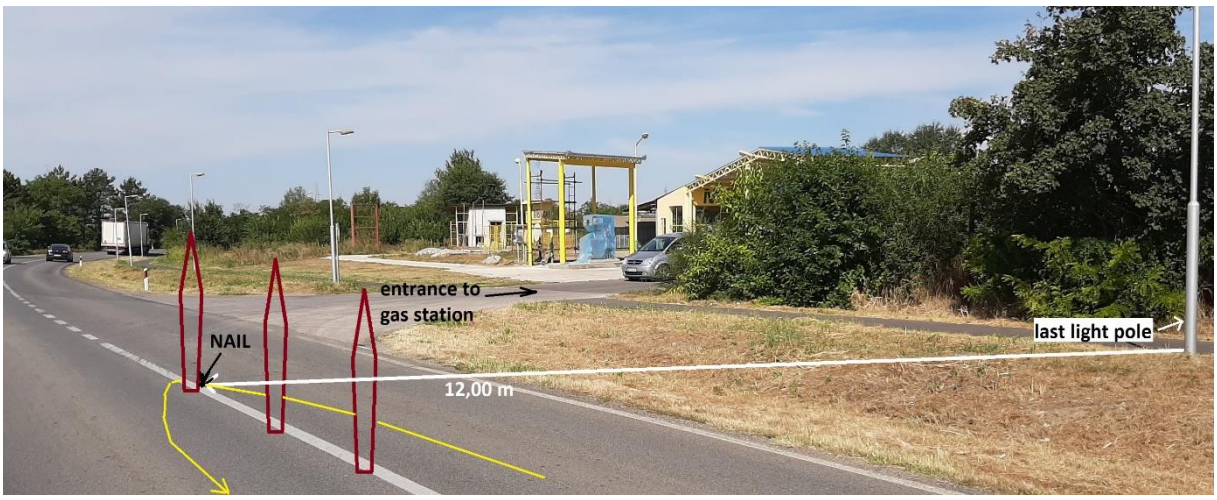
START backwards - (picture 6)

START side view – (picture 7)

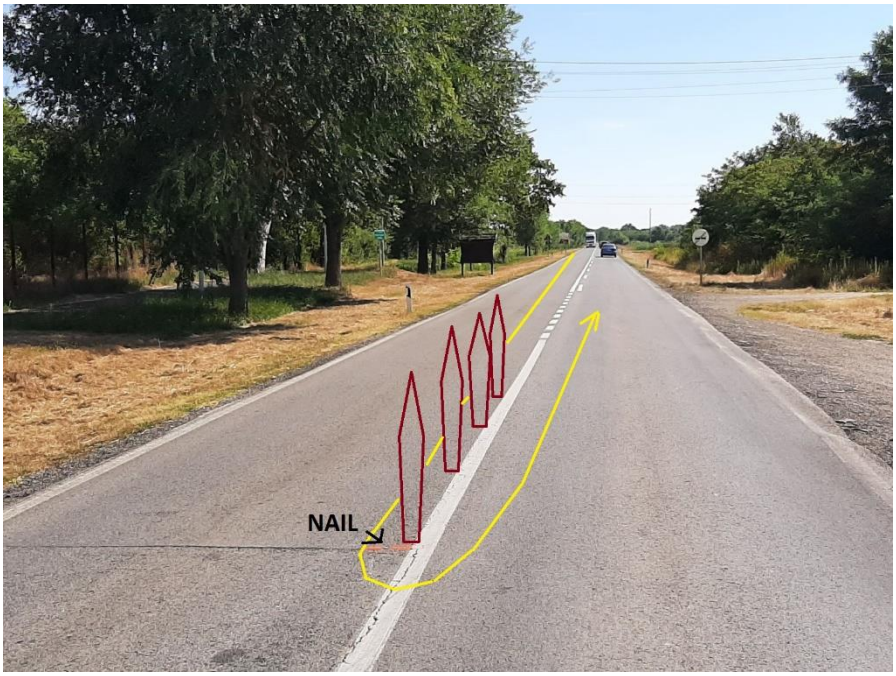


POINTS B and D – (picture 8)

TURN 10km onwards – (picture 9)

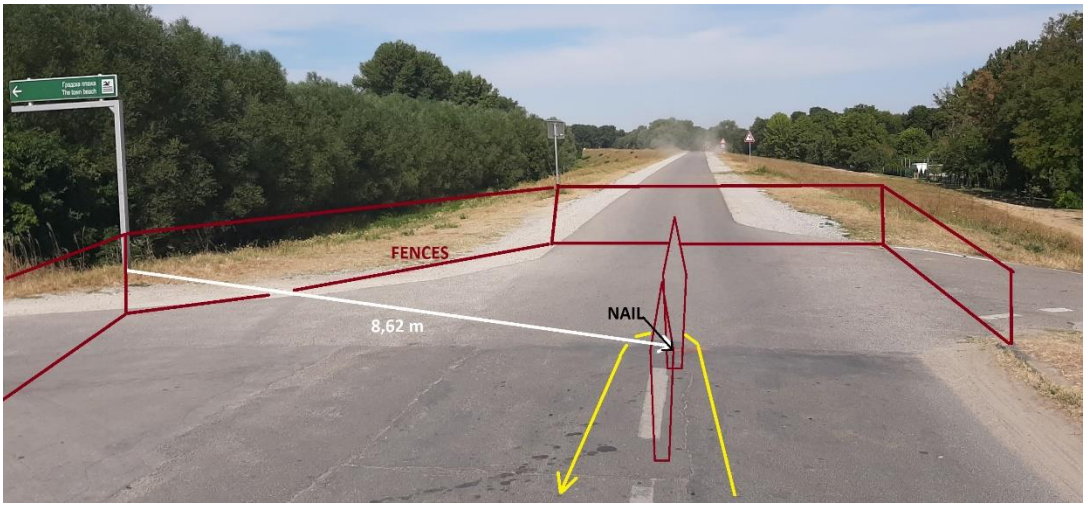


TURN 10km backwards – (picture 10)

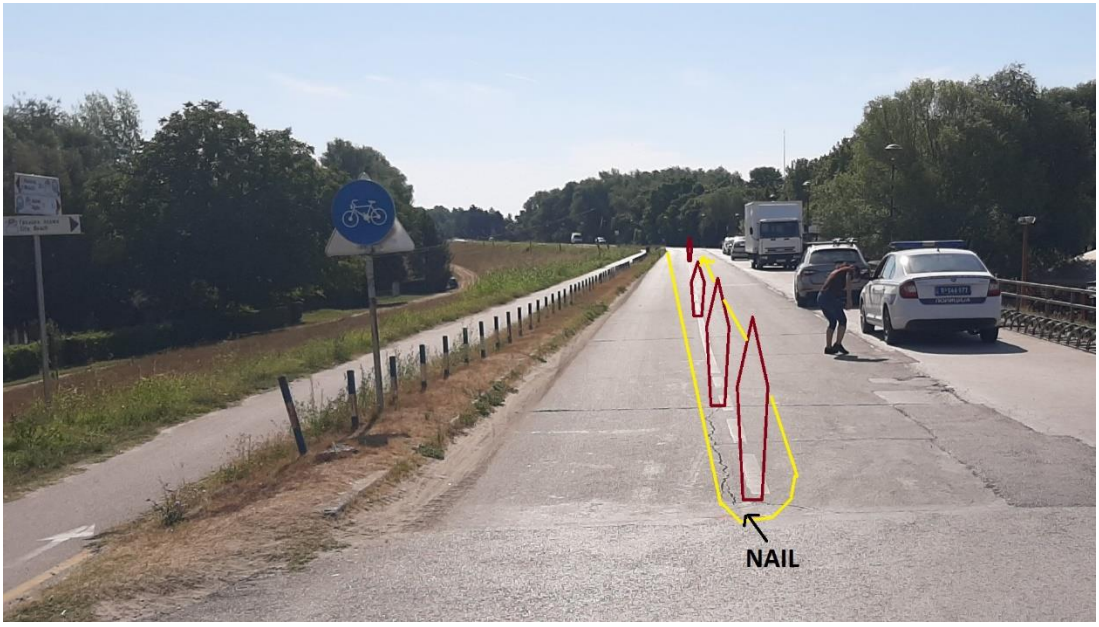


TURN 10km side view – (picture 11)

TURN halfmarathon onwards – (picture 12)

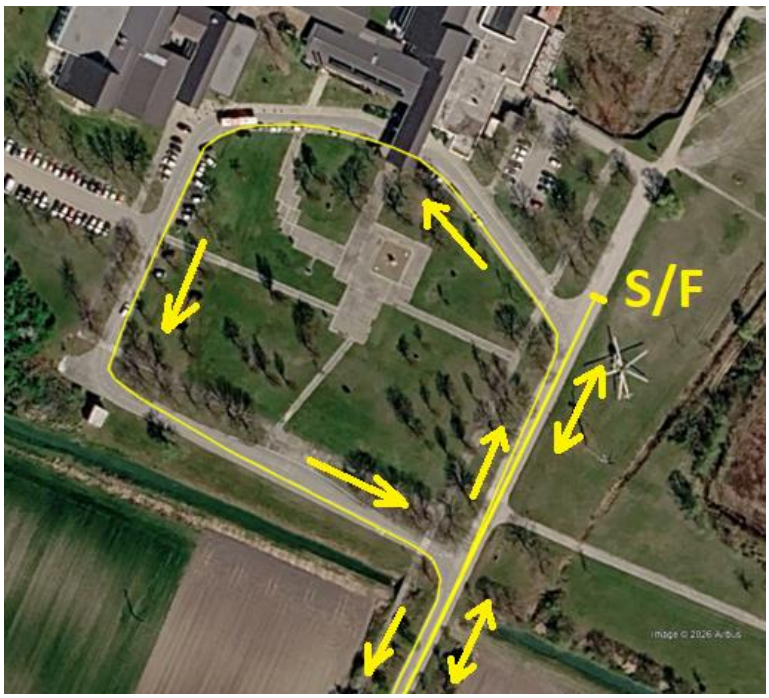


TURN halfmarathon backwards – (picture 13)

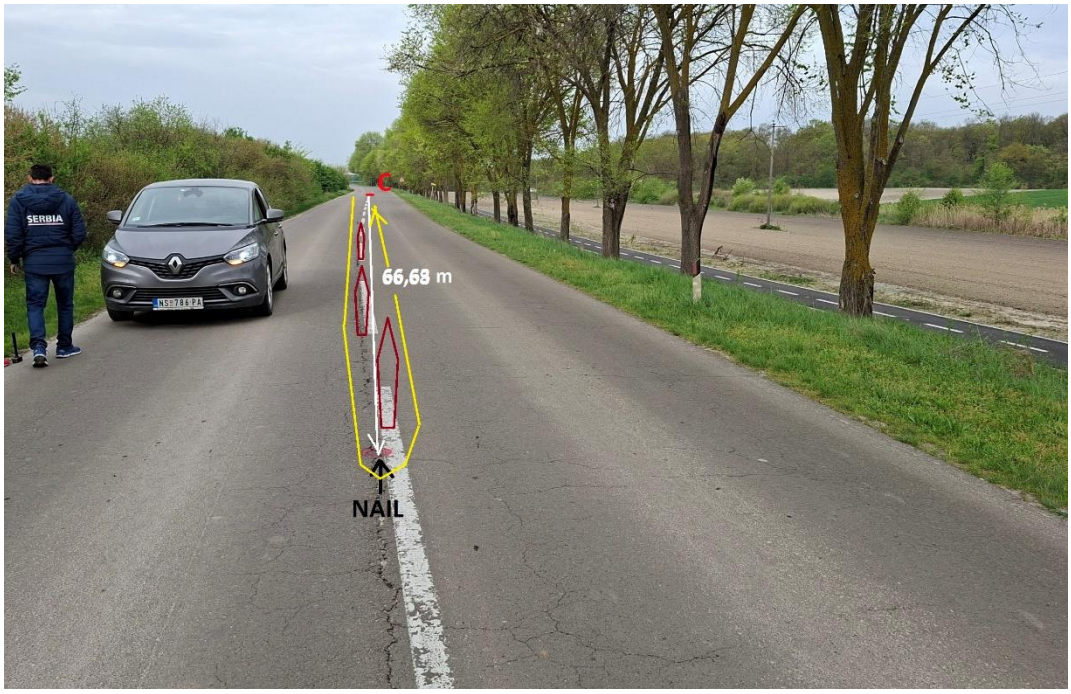


SITUATION ROUNDABOUT – (picture 14)

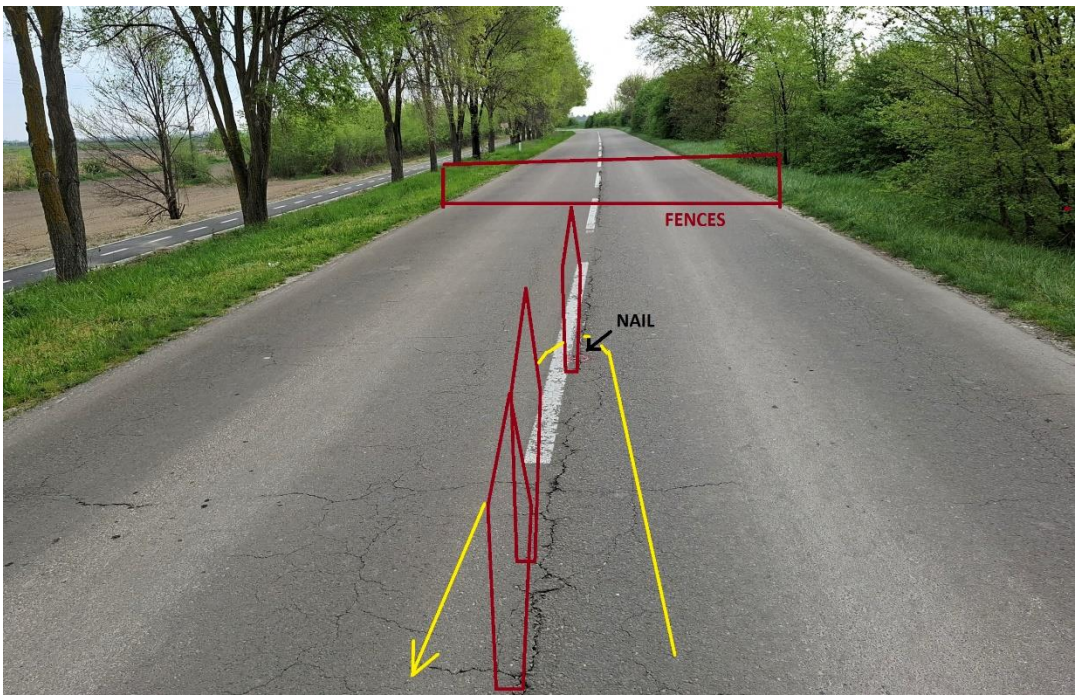
SITUATION START/FINISH – (picture 15)



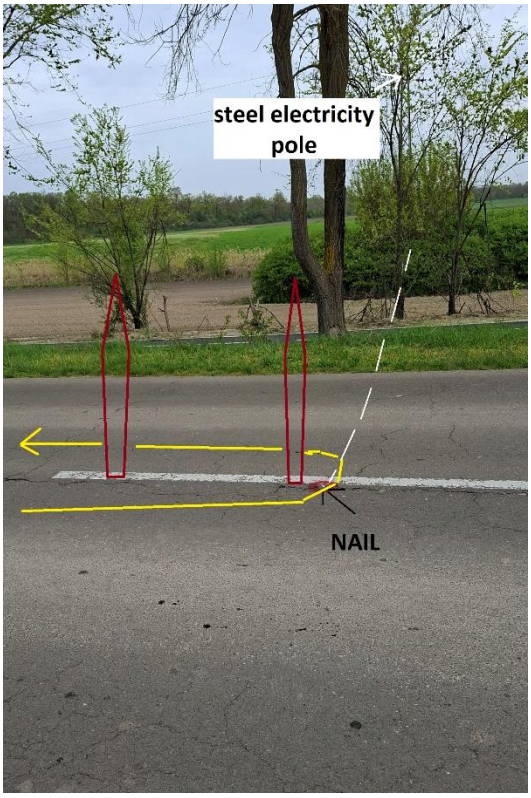
POINT C and TURN 1 – (picture 16)



TURN 1 onwards – (picture 17)



TURN 1 side view – (picture 18)



FINISH backwards – (picture 19)

COURSE halfmarathon – (picture 20)

COURSE 10km – (picture 21)

ELEVATION PROFILE halfmarathon – (picture 22)

ELEVATION PROFILE 10km – (picture 23)

Maribor, 22nd April 2026

Report prepared by: Borut Podgornik

GRADE A CERTIFIED
WORLD ATHLETICS
ROAD RACE COURSE MEASURER
In cooperation with AIMS