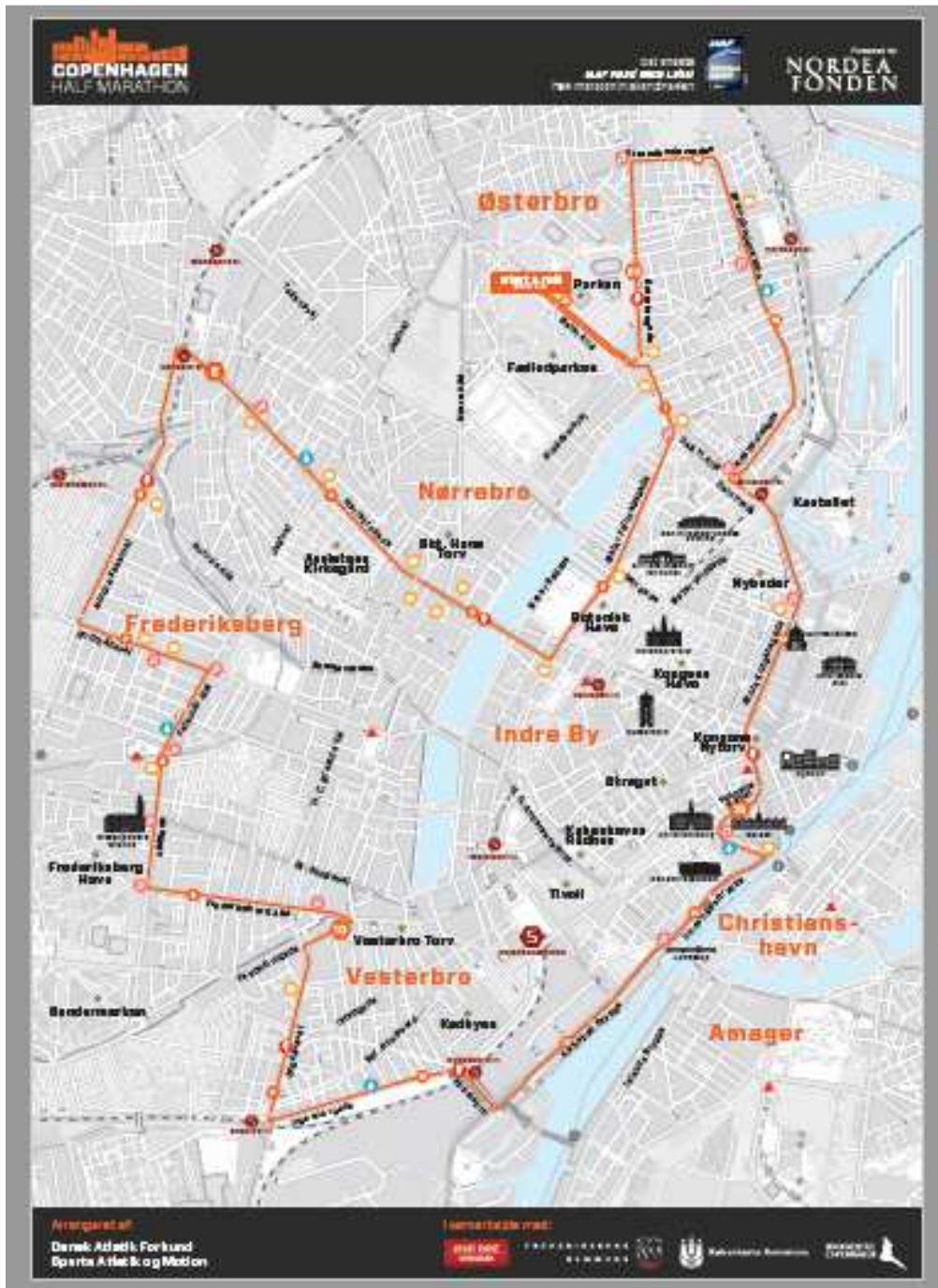


COURSE MEASUREMENT REPORT

Copenhagen Half Marathon 2016



SUMMARY SHEET

EVENT: ***COPENHAGEN HALF MARATHON***
LOCATION: ***COPENHAGEN, DENMARK***
DATE: ***18 SEPTEMBER 2016***
Promoting Organisation: Danish Athletic Federation/Sparta
Name & Address of race director: Lars Nissen
Sparta, Gunnar Nu Hansens Plads 11
DK – 2100 Copenhagen Ø, Denmark
Email: lars@sparta.dk
Distance: ***Half marathon course is not less than 21,097.5 m***
Measured by: ***Peer Jensen, Denmark***
Date: ***28 August 2016***
Measurement method: ***Jones counter (counting backwards) mounted on bicycle wheel***
Elevation, if not same, of: START 0 m FINISH 0 m
Distance, in a straight line, between start & finish: ***0 m***

Description of the Course

- i) Terrain: ***flat***
- ii) Race surface: ***tarmac roads***
- iii) Course configuration: ***closed loop***
- iiii) Start point: ***Øster Allé, 24 m north west of first yellow paper basket north west of P.H.Lings Allé***
- iiii) Finish point: ***Øster Allé, 24 m north west of first yellow paper basket north west of P.H.Lings Allé***

Measurement Details

- i) Section of road available: ***The entire width is available in all roads, except on Strandboulevarden between km 18 and 19 where only left part of the road can be used. Bicycle roads may not be used. Cones and fence will be placed at all turns.***
- ii) Line to be taken at turns: ***Shortest possible route.***

SIGNED: *Peer Jensen* DATE: ***2016-09-09***

STEEL TAPING DATA

EVENT: *COPENHAGEN HALF MARATHON*
LOCATION: *COPENHAGEN, DENMARK*
DATE: *18 SEPTEMBER 2016*

Calibration course

Name of calibration course: Serridslevvej, 420 m (in straight line) from finish line – se map.
Length of calibration course: 306 m
City/town and State: Copenhagen.
Date: 5 September 2010
Start time: 14:30
Finish time: 15:00
Pavement temperature: 17 °C

Measurements and calculations:

First measurement. 50.00 m x 6 + 6.01 = 306.01 m
Second measurement. 50.00 m x 6 + 6.01 = 306.01 m
Average raw (uncorrected) measurement of course 306.01 m
Temperature correction.
Correction factor = $1 - (3 \times 0.0000115) = 0.9999655$
 $306.01 \times 0.9999655 = 306.00$ m

Final (adjusted) length of calibration course 306.00 m

Pre-measurement

Date/Time 28 August 2016 7:55
Temp. 15 °C, rainy
Start End Reading
219800 223261 3461
223300 226763 3463
226800 230261 3461
230300 233765 3465

Average 3462.5

Working Constant 11315.36/km
+ 1 ‰ 11.32/km
Pre-measurement constant 11327/km

Post-measurement

Date/Time 28 August 2016 11:30
Temp. 18 °C, cloudy
Start End Reading
501100 504558 3458
504600 508063 3463
508100 511559 3459
511600 515063 3463

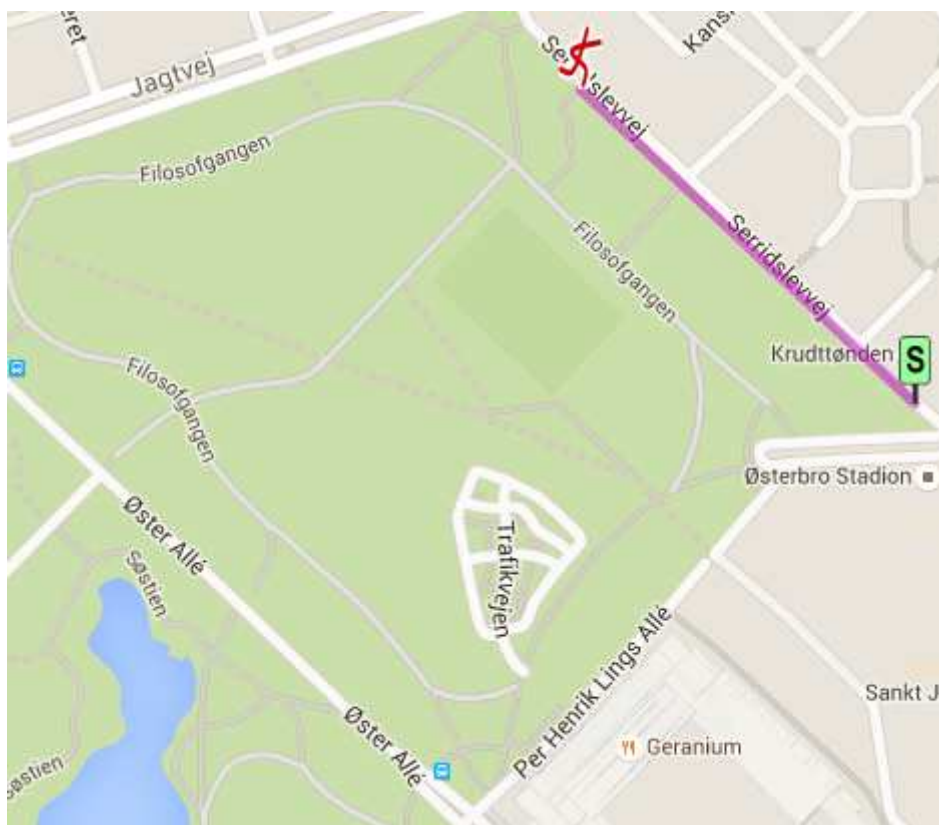
Average 3460.75

Working Constant 11309.64/km
+ 1 ‰ 11.31/km
Post-measurement constant 11321/km

Measurement working constant: **11327/km**
Constant for the Day (average): **11324/km**

CALIBRATION COURSE MAP

EVENT: ***COPENHAGEN HALF MARATHON***
LOCATION: ***COPENHAGEN, DENMARK***
DATE: ***18 SEPTEMBER 2016***



The calibration course compared to the start and finish line which is Øster Allé, 100 m North West of Per Henrik Lings Allé.

MEASUREMENT PROCEDURE

EVENT: *COPENHAGEN HALF MARATHON*
LOCATION: *COPENHAGEN, DENMARK*
DATE: *18 SEPTEMBER 2016*

Measurement working constant: **11327**

**Measurement of half marathon course. We were measuring against the running direction.
Start 8:25.**

Counter	Counts	Distance	Fix point
241896	0	21,0975 m	Finish line Øster Allé at electricity locker
243000	1104	21,000 m	
254327	12431	20,000 m	Østerbrogade at entrance café Phoenix
265654	23758	19,000 m	
276981	35085	18,000 m	
288308	46412	17,000 m	
299635	57739	16,000 m	
310962	69066	15,000 m	10 m after little fire station at National Bank
322289	80393	14,000 m	
333616	91720	13,000 m	
344943	103047	12,000 m	
356270	114374	11,000 m	
367597	125701	10,000 m	At Vesterbrogade 91F
378924	137028	9,000 m	
390251	148355	8,000 m	
401578	159682	7,000 m	
412905	171009	6,000 m	
424232	182336	5,000 m	Nørrebrogade, zebra crossing before "Hyltebro"
435559	193663	4,000 m	
446886	204990	3,000 m	
458213	216317	2,000 m	
469540	227644	1,000 m	
480867	238971	0,000 m	Start line Øster Allé at first paper basket after P.H. Lings Allé
481555			Finish line 60.75 m from the start line

**With the average constant 11324 the distance should be $3 \cdot 21.1 = 63.3$ counts shorter = 5.50 m
Which means that the distance between start and finish line is 66.25 m.**

At "Trianglen" after 20.3 km the runners can take a shorter way.
(490000-491192)=1192 counts = 105.3 m instead of
(491200-492597)=1397 counts = 123.4 m.

That reduce the distance between start and finish line with 18.10 m to 48.15 m

The organizers want start and finish line at the same place.

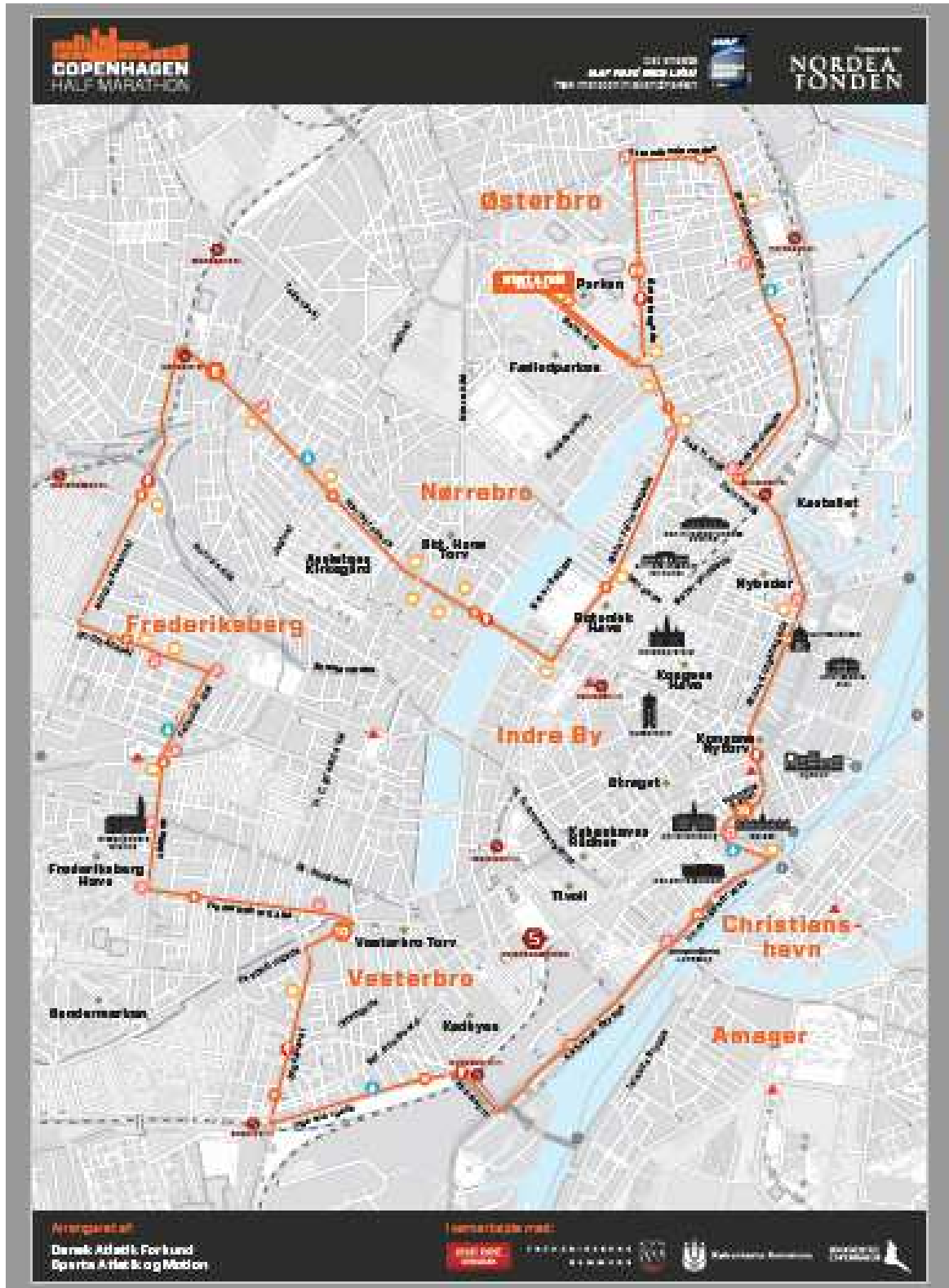
Conclusion: Finish line should be moved 24 m towards south east and start line should be moved 24 m towards North West. Km 21 should be moved 24 m and km 20 to km 1 should be moved 42 m (because of the 18 m at 20.3 km)

MAP of half marathon course

EVENT: *COPENHAGEN HALF MARATHON*

LOCATION: *COPENHAGEN, DENMARK*

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MAP of start and finish area

EVENT: *COPENHAGEN HALF MARATHON*

LOCATION: *COPENHAGEN, DENMARK*

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