

COURSE MEASUREMENT REPORT

Name of Event : Lokmat Aurangabad Maha Marathon 2018

Advertised Road Distance : 3 km, 5 km, 10km & Half-Marathon (21.0975 km)

Race Date : 16th December 2018

Race Director : Mr.Sanjay Patil

Address: c/o Lokmat Media Pvt. Ltd.
Lokmat Bhavan, Jalna Road,
Opp High Court,
Aurangabad – 431001.

Phone : +91- 9823144128

Name of Measurement : Anirudha Athani
team leader

Address : Flat No.10, Rushiraj Presidency Apts,
D'Souza Colony, Nashik - 422005, Maharashtra, India

Phone : +91-9822069872

Location of Start : Inside Divisional Sports Complex Gate, Near Sut-Girni Chowk,
Aurangabad, Maharashtra

Location of Finish : Same as Start

Type of Terrain : Mostly Flat and Undulating at some places

Type of Course : Out-and-back route for 3k, 5k, 10k & Half Marathon

Altitude : 573m at Start/Finish
(in Metres above Sea Level)

Distance between Start : Nil. (Start and finish are at the same point)
and Finish

Signed



Date : 12/12/2018

SUMMARY OF MEASUREMENTS

Dates of Measurement : 9th December 2018

How many measurements of the course were made : 2 (out and back)

Name of Measurer : Anirudha Athani

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

Entire Width of Left Carriageway is available to the runners.

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

For participants of 10 km & Half-Marathon, there needs to be physical restriction at the Junction of Jalgaon road to prevent the runners from turning into the service road. In order to ensure that participants run along the measured route organisers need to appoint volunteers or provide barricading/coning-taping at this location.

Length of the course after any adjustment : Not less than 3 km, 5 km, 10 km, 21.0975 km

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

The measurement in the out direction is used to establish the final course length.

There is a small difference between the Working constant and post-measurement constant. Accordingly the adjustment is calculated for the U-turn points of 3km, 5km, 10km & Half-Marathon.

OVERVIEW OF THE MEASUREMENT PROCEDURE :

The course is measured using a calibrated bicycle fitted with a Jones Counter. The basis of the measurement is to compare the number of revolutions of the bicycle wheel (recorded in counts) needed to cover the race course with the number of revolutions needed to cover a standard 'calibration course' of known length.

The following steps were followed :

1. Race course was defined after discussions with race director.
2. The calibration course was selected on a straight and flat section at MIDC Chikalthana near to the start point.
3. The bicycle was calibrated on the calibration course.
4. The measurement was started from the start point and turn-around points were marked for 3 km, 5 km, 10 km & Half-Marathon.
7. Post-calibration of the bicycle was done on the calibration course. There was a difference between the working constant and the Finish Constant, so the average of the two constants was taken as the Constant for the day. As the Constant of the day was greater than the Working constant, the adjustment was calculated and marked for 3k, 5k, 10k & HM turn-around points.
8. The measurement was documented.

DETAIL OF THE CALIBRATION COURSE

1. Name of Event: Lokmat Aurangabad MahaMarathon 2018
2. City/Town : Aurangabad, Maharashtra State, India
3. Location of Calibration Course: Straight and flat asphalt road in MIDC Chikalthana. Start opp DP Pole in front of Hotel President Banquet and Lawns and end opp Universal High School.
4. Length of Calibration Course: 300 m
5. Dates Measured : 9th November 2018
6. Method used to measure calibration course: Steel Tape
7. How many times did you measure the calibration course: 2
8. Measurement team Leader : Anirudha Athani
9. Address of Team Leader : Nashik, Maharashtra, India
10. Phone Number of Team Leader : +91-9822069872
11. Email Address of team leader: athani@live.com
12. List name and Duties of Team Members:

i. Mr.Sandeep Deulgaonkar ii. Mr.Abhishek Kunte iii. Mr.Abhay Bhonsale iv. Mr.Abhijeet Bhalkekar	}	General Assistance and Marking the points with Spray paint
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13. Is the Calibration course straight : Yes.
14. How are the start and finish points marked : Steel Nails & Paint
15. Are the start and finish points located in a road where the bicycle wheel can touch them or elsewhere :

Yes. The start/finish points are located on the straght road where bicycle wheel can touch them.
16. Bicycle check : This is a check against miscounting the number of tape lengths. (in case you use a gross measurement check other than a bicycle, please explain). Checked using Garmin.

A. Counts for full calibration course: 300m

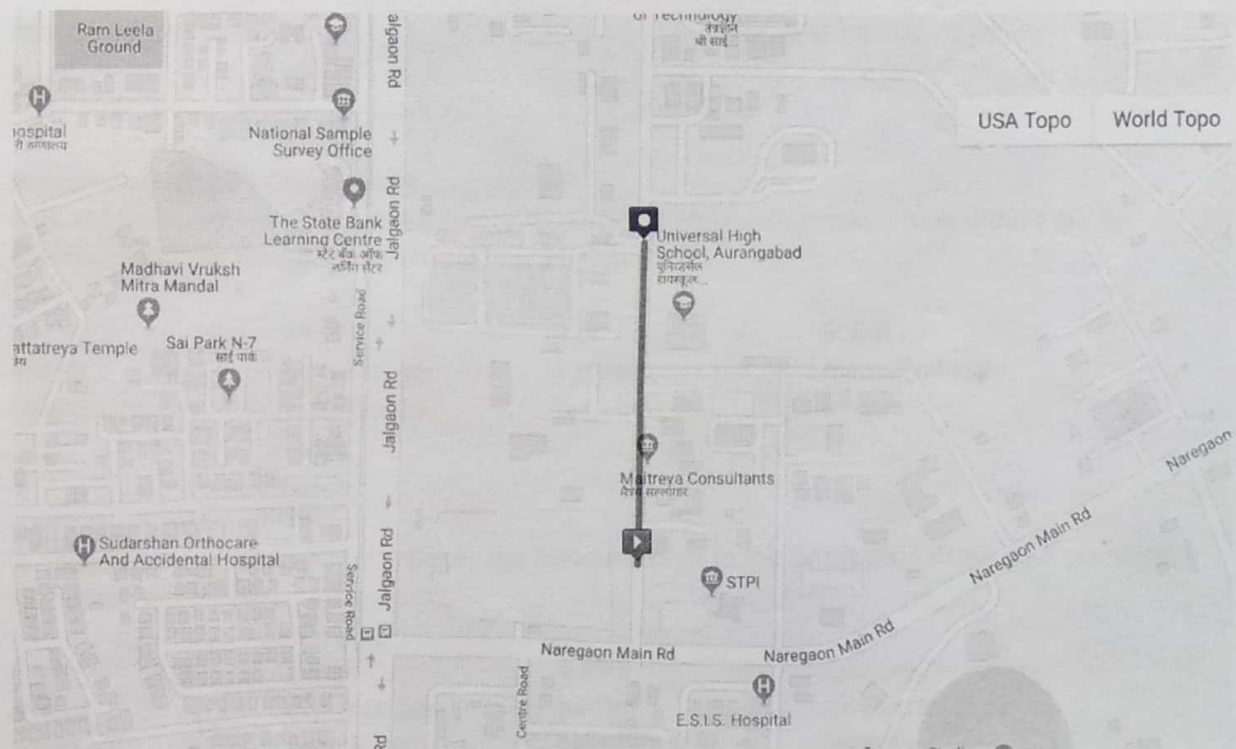
B. Counts for one tape length : 50m

C. Divide A by B

D Number of full tape lengths : 6

17. Submit a map of this calibration course, showing direction of north, the name of the road, (and relevant cross streets), and the exact location of the start and finish points, including taped distances from the nearby permanent locations.

Map location of Calibration Course



STEEL TAPING DATA SHEET
For measuring a calibration course

Name of Calibration Course : Universal High School Road, Off Naregaon Main Road, MIDC Chikalthana, Aurangabad.

City/Town and State : Aurangabad, Maharashtra, INDIA

Date : 9th December 2018

Start Time : 00:30 hours

Finish Time : 01:20 hours

Pavement Temperature : Start 21°C Finish 21°C

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 50m	+ 0	=	300m
# tape	distance per	partial		measured tape
lengths	tape length	tape lengths		lengths

2. Second Measurement : This checks the measurement to the finish point using a 50 cm offset from the start point.

5	x 50m	+ 49.5	=	249.5m
# tape	distance per	partial		measured tape
lengths	tape length	tape lengths		lengths

3. Average raw (Uncorrected) measurement of the course = 300m

4. Temperature correction : Use the average pavement temperature during measurement. Work out answer to at least 7 digits beyond the decimal point

Correction factor = $1.0000000 + (0.0000116 \times [\text{Celsius Temperature} - 20])$
 = $1.0000000 + (0.0000116 \times [21 - 20])$
 = 1.0000116

5. Multiply the temperature correction factor with the average raw measurement of the course

1.0000116	x	300m	=	300.00348 m
correction factor		average raw measurement		corrected measurement

Final (adjusted) length of the calibration course = 300.00348 m

BICYCLE CALIBRATION DATA SHEET

Name of Event : Lokmat Aurangabad MahaMarathon 2018

Date of Measurement : 9th Dec 2018

Name of Measurer : Anirudha Athani

Length of Calibration Course : 300.00348 m

PRE CALIBRATION – Ride the Calibration Course four times, recording data as follows :

Ride	Start Count	Finish Count	Difference
1	335979	339383	3404
2	339383	342789	3406
3	342789	346194	3405
4	346194	349600	3406

Time of the Day : 0115 on 9th Dec 2018

Temperature: 21°C

WORKING CONSTANT = number of counts in one kilometre calculated from the pre measurement average count, and multiplied by 1.001

Pre measurement Average count = $(3404 + 3406 + 3405 + 3406) / 4 = 3405.25$

Counts/km = Pre measurement average count $\times 1000 / \text{length of calibration course}$
= $3405.25 \times 1000 / 300.00348$
= 11350.7017

Working Constant = counts per km $\times 1.001$
= 11350.7017×1.001
= 11362.0524

POST CALIBRATION – Ride the Calibration Course four times, recording data as follows :

Ride	Start Count	Finish Count	Difference
1	590712	594119	3407
2	594119	597528	3409
3	597528	600935	3407
4	600935	604345	3410

Time of the Day : 0530 on 9th Dec 2018

Temperature: 16 °C

FINISH CONSTANT = number of counts in one kilometre calculated from the pre measurement average count, and multiplied by 1.001

Post measurement Average count = $(3406 + 3409 + 3408 + 3410) / 4 = 3408.25$

Counts/km = Post measurement average count \times 1000/length of calibration course
= $3408.25 \times 1000 / 300.00348$
= 11360.7015

Finish Constant = counts per km \times 1.001
= 11360.7015×1.001
= 11372.0622

CONSTANT FOR THE DAY = The average of the working constant and the finish constant
= $(11362.0524 + 11372.0622) / 2$
= 11367.0573 per km

COURSE MEASUREMENT DATA SHEET

Name of the Event : Lokmat Aurangabad MahaMarathon 2018

Name of Measurer : Anirudha Athani

Date of Measurement : 9th November 2018

Start Time : 0130 Temperature : 21° C

Finish Time : 0530 Temperature : 16° C

Constant for the day : 11367.0573

DESCRIPTION OF THE ROUTE:

1. Start line for all distance categories is located inside the Divisional Sports Complex on the plain ground in front of the stadium.
2. After flag-off, all the runners will come out of the complex gate and run towards Sut-girni chowk on the left carriageway.
3. All runners will take left turn at Sut-girni chowk, remaining on the left carriageway of Garkheda road.
4. 3 km Runners will take u-turn at the 1.5 km mark and remaining runners will continue running towards Seven Hills Chowk and turn right on Jalna Road.
5. 5 km runners will take u-turn opp Lokmat Bhavan and remain on the same carriageway and return to the start/finish point.
6. 10km & Half-Marathon Runners will continue on the same carriageway on Jalna Road upto Jalgaon Road Junction and take a left turn onto the left carriageway of Jalgaon Road.
7. 10 km runners will take u-turn opp Indo-German Tool Room and return back to Start/Finish Point on the same carriageway.
8. Half-Marathon runners will continue running on Jalgaon Road upto Harsul T-Point, taking a left turn onto the left carriageway of Delhi Gate Road.
9. Half-Marathon runners will take u-turn at their u-turn point near Winchester Nursery school and turn back on the same carriageway and retrace the same route to the Start/Finish point.

A. CALCULATION FOR TURNAROUND POINTS DISTANCE FROM START POINT

1. FOR 3 KM RUN:

Race Distance = 3,000 m

Therefore,

Distance of 3km Turnaround point from Start Point= $\frac{3000}{2} = 1500$ m

2. FOR 5 KM RUN:

Race Distance = 5,000 m

Therefore,

Distance of 10km Turnaround point from Start Point= $\frac{5000}{2} = 2500$ m

3. FOR 10 KM RUN:

Race Distance = 10,000 m

Therefore,

Distance of 10km Turnaround point from Start Point= $\frac{10000}{2} = 5000$ m

4. FOR HALF-MARATHON:

Race Distance = 21,097.5 m

Therefore,

Distance of Half-Marathon Turnaround point from Start Point= $\frac{21097.5}{2} = 10548.75$ m

B. MEASUREMENT DATA:

Location	Counter Reading	Cumulative Counts	Distance from Start Point in metres	Adjustment in metres
Race Start/Finish Line inside Divisional Sports Complex Compound	350660	0	0	
Opp Samsung Smart Plaza on Shivaji Nagar Road	352932	2272	199.876	
Gayatri Medical Stores Corner	354069	3408	299.814	
Opp Shri Samarth Opticals Pay and Park on Garkheda Road	355205	4544	399.751	
Opp Dnyanaraddha Co-op Credit Society on Garkheda Road	356361	5681	499.778	
Speed Breaker Board Opp. Ezee Battery, Garkheda Road	359750	9090	799.679	
K-Pond Chowk, Opp Dsouza Wines, Garkheda Road	362022	11362	999.555	
Opp. Saraswat Bank ATM/Opp Gajanan Maharaj Bhawan, Garkheda Road Turn-Around Point for 3k runners	367703	17043	1499.332	Post-measurement Adjustment of 0.668m towards 7-hills junction
Opp Cuba3/Opp Arihant Honda Showroom, Garkheda Road	373384	22724	1999.110	
Opp Atitih Hotel Parking Gate, Jalna Road	379065	28405	2498.888	
Opp Lokmat Bhavan Gate on Jalna Road Turn-around point for 5k runners	382307	31647	2784.098	
Opp SBI Board/Opp Hotel Welcome Rama on Jalna Road	384746	34086	2998.665	
Opp SBI Personal Banking Branch Bus stop on Jalgaon Road	396108	45448	3998.220	
Opp Indo-German Tool-Room on Jalgaon Road. Turn-around point for 10k runners	407470	56810	4997.78	Post-measurement Adjustment of 2.22m towards Harsul T-Point
Opp "e-Priority" board/Opp Water Tank on Jalgaon Road	418832	68172	5997.331	
Opp Radhakrishna Mangal Karyalay, Jalgaon Road	430194	79534	6996.886	
Vishwa Shanti Buddha Vihar Board/Opp Smashan on Jalgaon	441556	90896	7996.441	

Road				
Opp Ultra-High Tension Power House/ Opp Water Tank on Delhi Gate Road	452918	102258	8995.996	
Opp DP Transformer/Opp HDFC Bank/DCB Bank on Delhi Gate Road	464280	113620	9995.551	
Near Winchester Nursery School, Opp Tempo Stand on Delhi Gate Road Turn-around point for Half-Marathon Runners	470515	119855	10544.066	Post-measurement Adjustment of 4.684m towards Delhi Gate

Opp Shifa Medical/Opp AMC Primary School on Delhi Gate Road	475642	124982	10995.106	
Opp Maharashtra Garage/Power House Compound Corner on Delhi Gate Road	487004	136344	11994.661	
Opp Pagariya Bajaj Showroom on Jalgaon Road	498366	147706	12994.216	
Opp Jai Janardhan Health Care Shop/"e-Priority" Board on Jalgaon Road	509728	159068	13993.771	
Opp Mahatma Jyotiba Phule Samajik Sabhagruha/Yash Super Shop on Jalgaon Road	521090	170430	14993.326	
Opp Shubham Bhojanalay on Jalgaon Road	532452	181792	15992.881	
Opp Hotel Windsor Castle Bus-Stop on Jalgaon Road	543814	193154	16992.437	
Opp Ambassador Hotel on Jalna Road	555176	204516	17991.992	
Opp Fransalian School of Excellence Gate on Garkheda Road	566538	215878	18991.547	
Opp Reliance Jewels on Garkheda Road	577900	227240	19991.102	
Opp Divisional Sports Complex Gate	589262	238602	20990.657	
Start/Finish Line inside Divisional Sports Complex Compound	590499	239839	21099.48	

1. 3 km course:

Desired Length of Course : 3000.000 m

Length of Course as measured : $1499.332 + 1499.332 = 2998.664$ m

Note any adjustments made to the course after measurement : Adjusted U-Turn point by 0.668 m towards 7-hills Junction

Final Length of course = $2998.664 + 0.668 + 0.668 = 3000.000$ m

2. 5km Course :

Desired Length of Course : 5000.000 m

Length of Course as measured : $2784.098 + 2784.098 = 5568.196$ m

Note any adjustments made to the course after measurement : None

Final Length of course = 5568.196 m

3. 10km Course:

Desired Length of Course : 10000.000 m

Length of Course as measured : $4997.78 + 4997.78 = 9995.56$ m

Note any adjustments made to the course after measurement : Adjusted Turn-around point by 2.22 m towards Harsul T-Point

Final Length of course = $9995.56 + 2.22 + 2.22 = 10000.000$ m

4. Half-Marathon Course:

Desired Length of Course : 21097.500 m

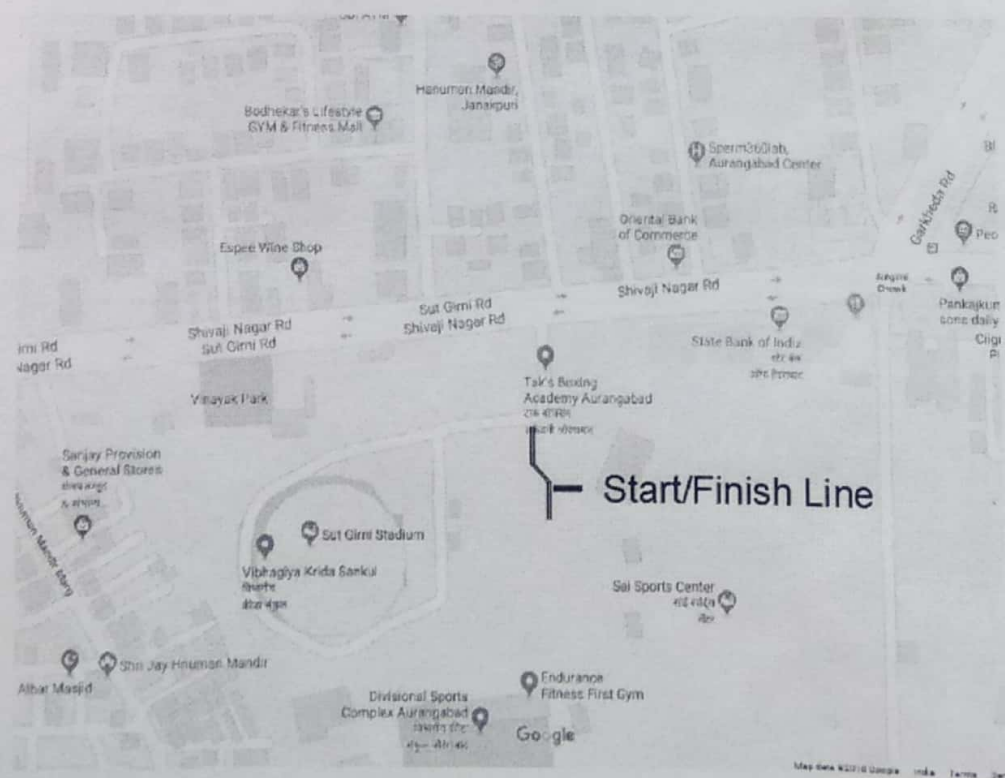
Length of Course as measured : $10544.066 + 10544.066 = 21088.132$ m

Note any adjustments made to the course after measurement : Adjusted Turn-around point by 4.684m towards Delhi Gate

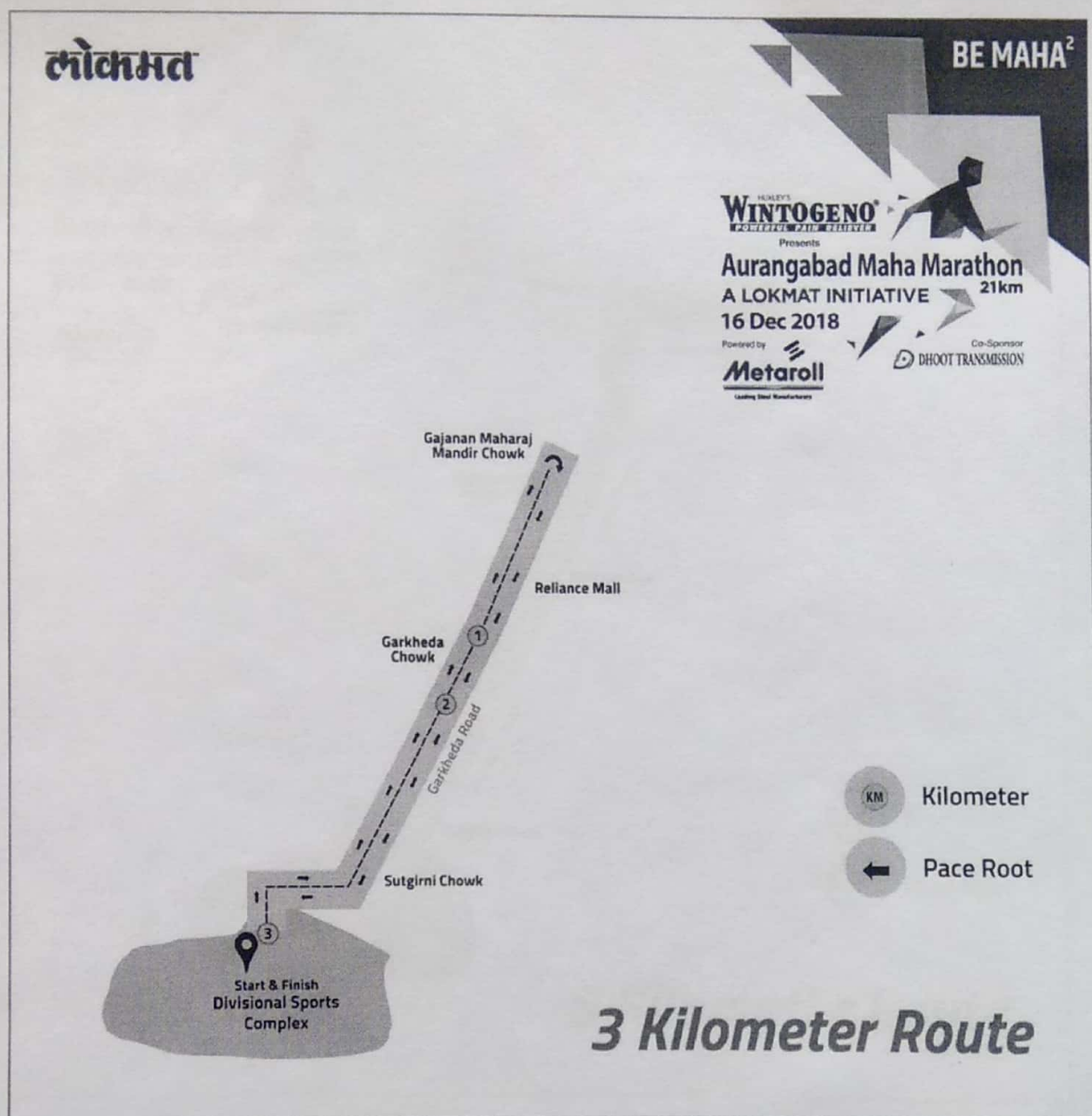
Final Length of course = $21088.132 + 4.684 + 4.684 = 21097.500$ m

LOCATION OF START/FINISH LINE :

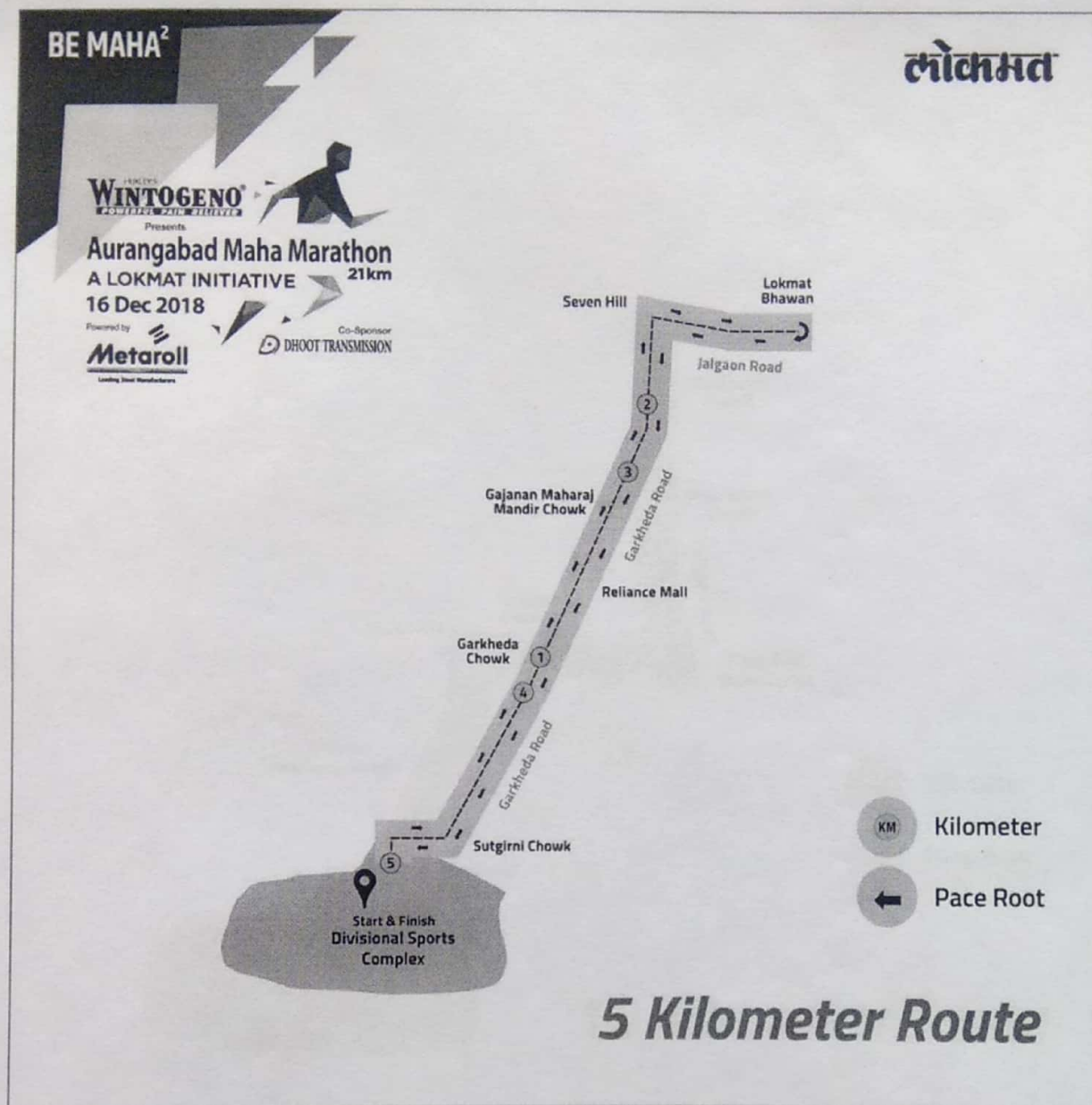
Flat ground inside Divisional Sports Complex Gate,
Near Sut-girni Chowk
Aurangabad – 431005



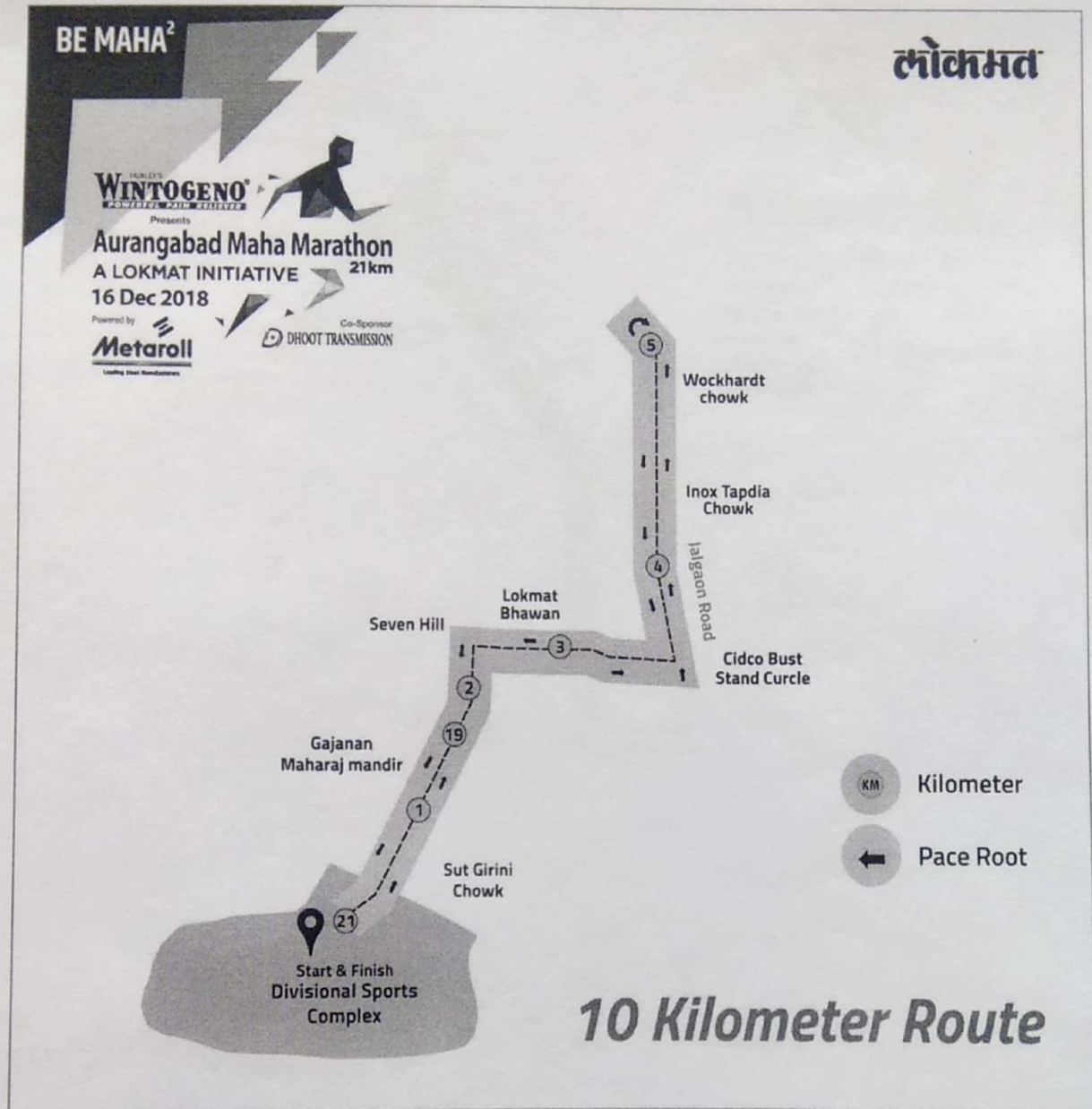
ROUTE MAP FOR 3 KM



ROUTE MAP FOR 5 KM



ROUTE MAP FOR 10 KM



ROUTE MAP FOR HALF-MARATHON

