



**ENQUIRY REPORT ON THE
INCIDENT OF DEMISE OF
DR. AMARAPURKAR DUE TO
FALLING IN S.W.D. MANHOLE
ON 29.08.2017**

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1. Preamble

On 29th August, 2017 during heavy rains and consequent flooding in city area, death of Dr. Amarpurkar occurred allegedly due to falling in an open manhole of storm water drain on Senapati Bapat Marg in G/South Ward. Hon'ble Municipal Commissioner of Municipal Corporation of Greater Mumbai vide letter u/no.MGC/A/9350 dated 01.09.2017 appointed Shri Vijay Singhal, I.A.S., Additional Municipal Commissioner (Eastern Suburbs) as Chairman and Shri C. D. Chore, Deputy Municipal Commissioner (Improvement) and Shri V. P. Chithore, Director (Engineering Services & Projects)/Chief Engineer (Roads & Traffic) as members.

2. Terms of Reference

As per orders of Hon'ble Municipal Commissioner mentioned above, the Terms of Reference for the Committee was to submit a detailed report on the following:

- Details of Incident
- Cause of the incident
- Proposed Course of Action
- Measures to be taken to prevent such incidents in future

3. Enquiry Committee

1.	Shri Vijay Singhal I.A.S.	Additional Municipal Commissioner (Eastern Suburbs)	Chairman
2.	Shri C. D. Chore	Dy. Municipal Commissioner (Improvement)	Member
3.	Shri V. P. Chithore	Director (ES&P)(i/c) / Ch.Eng.(Roads & Traffic)	Member

Team to help the Committee in enquiry

Following officers were also appointed for helping it in its enquiry:

- | | | |
|----|---------------------|----------------------------------|
| 1. | Shri Hemant Tipnis | Dy.Chief Officer (Enq.) |
| 2. | Shri C.C.Jage | Asstt. Engineer(S.W.D.)E.S |
| 3. | Shri A.A.Vishwasrao | Asstt. Engineer(S.W.D.)Plg. Cell |
| 4. | Smt.Shreya Hule | Asstt. Chief Officer (Enq.) |

4. Details of Incident

On 29th August 2017, a message was received in the evening by G/South Ward Disaster Control Room about a person having fallen in an open manhole near Sarthi Bar. This message was followed by a letter from Police staff of Dadar Police Station seeking help in tracing the missing person suspected to have fallen into a municipal manhole. Search operations were started by the Fire Brigade team of Shivaji Park Fire Station along with the Police staff.

A call was received by A.E.(SWM) G/South from Police authority at 10:00 pm seeking information about the direction of the flow in the manhole. The details about the flow of water in the drain were explained to the Police authorities as well as the Fire Authorities present on site.

On 30th August 2017, a missing complaint was registered by Smt. Manisha Narayan Amarpurkar, sister of Dr. Deepak Narayan Amarpurkar.

On 31st August 2017, a dead body was found at Cleveland drain, Worli and was identified as of Dr. Deepak Narayan Amarpurkar.

5. Enquiry Timeline

Date & Time	Description of Activity
29.08.2017	Alleged falling of Dr.Amarapurkar in an open manhole of storm water drain on Senapati Bapat Marg reported by some eye witness to Police.
01.09.2017	Shri Vijay Singhal, I.A.S., Additional Municipal Commissioner (Eastern Suburbs) appointed to enquire into this incident by Hon'ble Municipal Commissioner.
04.09.2017	<ul style="list-style-type: none">● Shri Vijay Singhal, I.A.S., Additional Municipal Commissioner (Eastern Suburbs) appointed Shri C. D. Chore, Deputy Municipal Commissioner (Improvement) and Shri V. P. Chithore, Director (Engineering Services & Projects)/Chief Engineer (Roads & Traffic) as members of the Enquiry Committee to assist him in conducting enquiry into the incident.● Documents required for the enquiry were enlisted and necessary directions were issued to E.E.(S.W.D.), Ch.O.(D.M.P.) and A.C.(G/South) for submission of the same by 06.09.2017.
08.09.2017	<ul style="list-style-type: none">● The Enquiry Committee included Shri. Hemant Tipnis, Dy. Chief Officer (Enq.), Shri. C. C. Jage, Asstt. Engineer(S.W.D.) E.S., Shri. A. A. Vishwasrao, Asstt. Engineer(S.W.D.) Plg. Cell and Smt. Shreya Hule, Asstt. Chief Officer (Enq.) to assist.● A Co-ordination meeting to decide the course of action was conducted by D.M.C.(Imp.) and Director (E.S.&P.) with the enquiry team in D.M.C.(Imp.)'s office.

11.09.2017	<ul style="list-style-type: none"> ● Preliminary discussion with the Enquiries department staff were held at G/South Ward office and the work of taking statements of the staff concerned was started. ● Statement of Shri R. N. Choughule, Mukadam, G/2 section, G/South Ward was recorded.
12.09.2017	<ul style="list-style-type: none"> ● Statements of Shri Harshal C. Khairnar, Sub-Engineer(Civil), S.W.D.(City) Z-II, Shri Ranjit J. Valvi, Asstt. Engineer(O & M) S.W.D. (Civil) and Shri Bharat W. Bamble, Asstt. Engineer(O & M) S.W.D. (Mech.) were recorded. ● Preparation of preliminary Draft report was started.
13.09.2017	<ul style="list-style-type: none"> ● Statements of Shri Sanjay B. Sambare, Asstt. Engineer (S.W.D.) City, Z-II, Shri G.S.Nanote, Asstt. Engineer(S.W.M.) G/South Ward, Shri R. S. Yadav, S.E.(S.W.D.) G/South Ward were recorded. ● D.M.C.(Imp.) visited G/South Ward Office to review the progress of the enquiry. ● D.M.C.(Imp.) met some nearby residents in their residences to know about the actual circumstances surrounding the incident and requested to them give statements, which was politely declined by them.
14.09.2017	<ul style="list-style-type: none"> ● Information regarding Pumping operation at Cleveland Storm Water Pumping Station such as number of pumps, number of pumps operated on the incident day, volume of storm water pumped out into the sea, operation of pumps even after opening of mitre gates to help in fast receding of storm water upstream. ● Document collection in progress.
15.09.2017	<ul style="list-style-type: none"> ● Receipt of CCTV footage from Police ● Discussion with A.M.C.(E.S.) for finalisation of the enquiry report

6. Methodology of Enquiry Committee

The Methodology adopted by Enquiry Committee is given below:

1. Data Compilation
2. Observations based on Data Compilation
3. Fixing Responsibility
4. Recommendations on measures to be taken to prevent such incidents in future.

6.1 Data Compilation

The Committee felt it necessary to examine various documents available with various stakeholders to establish probable causes of the alleged incident. This was in addition to the personal interaction and statements of various stakeholders connected to this incident.

The exhaustive list of documents compiled and examined by this Committee is as follows:

Sr. No.	Documents	Annexure / Pg.no.
1	Copy of Google map showing the S.W.D.Network along Senapati Bapat Marg and S.L.Matkar Marg and details of the incident manhole such as size of manhole, material, size and thickness of cover	297
2	Plan showing details of storm water box drain and manholes existing along S.L.Matkar Road	279
3	Photo showing manhole at incident location visited by Enquiry Committee along with Assistant Commissioner G/South Ward and SWD Officials	421
4	Photos of manhole at incident location taken from bridge	191, 193

5	Photos showing members of Enquiry Committee's visit to nearby residents for getting information about the incident on 29th August 2017	407
6	Communication with Dr. Mrs. Amrapurkar for her inputs on the incident	403
7	Communication with Architect Shri Pravin Naik for his inputs on the incident	405
8	Rainfall data of date 29th August 2017	355
9	Plan showing flooding spots in G/South Ward on 29th August 2017	17
10	List of water logging spots in G/South Ward on 29.08.2017 showing location of the flooding spot, approximate depth of flooding, number of pumps in operation and flooding time	19
11	Copy of the statement of Mukadam and 7 nos. Labours of G/2 section of G/South Ward regarding work done on 29th August 2017 alongwith copies of their job slips	21 to 29
12	Statements of staff of G/South Ward and S.W.D.	203 to 212 and 341 to 352
13	Photos of labour staff of O&M (SWD) department working at Senapati Bapat Marg near Indiabulls Sky Tower and at Fitwala Road junction	31, 33
14	Letters dated 8th September 2017 by Assistant Commissioner G/South Ward to nearby residents	165 to 181
15	i) CCTV footage in pendrive obtained from Police Department (pen drive) alongwith forwarding letter and	i) 397

	ii) CCTV footage in 3 DVDs obtained from M/s.Kumar Cargo Service having shop on S.L.Matkar Marg alongwith their letter regarding clarification on the discrepancy observed in the date recorded on the footage.	ii)183, 185, 187 and 201 & 202
16	Letter dated 4th September 2017 to Vodafone regarding the location and call details of Dr. Amarapurkar on 29.08.2017	399
17	Letter dated 4th September 2017 to Sr. Police Inspector, Dadar Police Station for providing copy of Police Panchnama, photos of the dead body and any other relevant information regarding the incident as well as details from Vodafone about the call details with locations of Dr.Amarapurkar on 29th August 2017	393
18	Letter dated 6th September 2017 to Sr. Police Inspector, Dadar Police Station for providing copy of post mortem report related to Dr. Amarapurkar	11
19	Letter dated 8th September 2017 from Police Authority to MCGM denying photos and other documents	9
20	Letter dated 8th September 2017 to Assistant Commissioner of Police, Abihyan for providing CCTV footage of cameras at and nearby to the incident location	395
21	Note dated 4th September 2017 to Dean, Sion Hospital for providing copy of post mortem report along with histopathological report related to Dr. Amarapurkar	401
22	TV Channel clippings about the incident obtained from a private company	353
23	Public advertisement published on 09.09.2017 in local newspapers calling for suggestions for manhole improvements	409 to 415

24	Report of Catchment area no.129 (covering the incident location)	319 to 337
25	Plan showing sewerage rising main passing along Senapati Bapat Marg and S.L.Matkar Road	15
26	Details of complaints of flooding at the incident location from 2013	357
27	Working of Cleaveland Storm Water Pumping Station on 29th August 2017	301 to 317
28	Report of Assistant Commissioner G/South Ward	1 to 8
29	Report of G/South Ward and SWD department about reason of flooding at the incident location	6, 7 and 277 respectively

6.2 Observations based on Data Compilation

6.2.1 Statements of MCGM Staff

6.2.1.1 Statement of G/South Ward staff

The written statements of A.E.(S.W.M.) G/South, S.E.(S.W.D.) G/South and Mukadam, G/2 section, G/South are filed in box file at pg.no.203 to 212.

As per the statements of the staff concerned of G/South Ward, the stormwater drain at the incident location, being under the purview of Dy.Ch.Eng(S.W.D.) City Const division, the incident manhole on the box drain was not opened by their staff on 29th August 2017.

6.2.1.2 Plan showing flooding spots in G/South Ward on 29th August 2017 submitted by Assistant Commissioner G/South

It is seen from the plan and the list that on 29th August 2017, 23 locations in G/South were affected by flooding ranging from 1 feet to 3.4 feet and which includes parts of major roads such as Khan Abdul Gaffar Khan Road, Dr. E. Moses Road, Pandurang Budhkar Marg, N.M.Joshi Marg, Senapati Bapat Marg and S.L.Matkar Road, Balaseth Madurkar Road as well as Currey Road Railway Station area. This plan shows that major areas in G/South Ward was flooded on 29th August 2017 during heavy rains.

6.2.1.3 Copy of the statement of Mukadam and 7 nos. Labours of G/2 section of G/South Ward regarding work done on 29th August 2017 alongwith copies of their job slips

The concerned Mukadam and his labours working in G/2 section, G/South Ward were seen working at various locations away from the incident location, but in the same ward.

They have stated that no orders were received by them and that they had not opened any manholes to drain off the water quickly on 29th August 2017. They have also specifically stated that they had not opened manholes on S.L.Matkar Road on 29th August 2017.

6.2.1.4 Letters dated 8th September 2017 by Assistant Commissioner G/South Ward to nearby residents

Letters were written by Assistant Commissioner G/South Ward on 8th September 2017 to nearby residents requesting for providing CCTV footage related to the incident.

6.2.1.5 Report of G/South Ward and SWD department about reason of flooding at the incident location

It is stated in the report of Assistant Commissioner G/South Ward that the areas around Elphinstone Road station i.e. Balashet Madurkar Marg, Fitwala Road, Jagannath Bhatankar road, Elphinstone Road are low level on both sides and S.L.Matkar Marg alongwith Senapati Bapat Marg are prone to flooding during very heavy rainfall. Assistant Commissioner G/South has further stated that the natural topography of the area is such that this area is low lying as compared to adjoining roads and the rain water from adjoining areas tends to flow towards this road.

It is stated in the report of Dy.Ch.E. (SWD) Const City that the main reason for the flooding on 29th August 2017 in city area is the heavy intensity of rains. Also the intensity of the rainfall at the location under reference is 320 mm in 24 hours and there is bottleneck portion for the length of 80 m of the storm water drain coming from Fitwala lane at the junction of Senapati Bapat Marg and S.L.Matkar Marg, due to which

receding time of storm water increased at these portions i.e. Parel station premises, Elphinstone station, Fitwala lane.

6.2.1.6 Minutes of meetings of Hon. Municipal Commissioner

Hon. Municipal Commissioner during his monthly review meetings with the HODs, DMCs, Assistant Commissioner on 07.05.2015, 06.06.2015, 15.06.2015, 07.07.2015, 04.04.2016, 06.06.2016, 06.09.2016 and 03.04.2017 have issued orders to ensure procurement of sufficient quantities of various sizes of manhole covers, given authority to all concerned to procure the same and purchase powers were given to Ward Offices, ensure that no manholes are found open in their respective jurisdictions to avoid any accidents. The minutes of these meetings are attached in box file at page no. 213 to 275.

6.2.2 Statement of S.W.D. staff

The statements of Shri Harshal C. Khairnar, Sub-Engineer(Civil), S.W.D.(City)Z-II, Shri. Sanjay Bhima Sambhare, Asstt. Engineer, S.W.D.(City)Z-II, Shri Ranjit J. Valvi, Asstt. Engineer(O&M) S.W.D.(Civil) and Shri Bharat Walchand Bamble, Asstt. Engineer (O&M)S.W.D.(Mech.) are filed in box file at pg.no. 341 to 352.

After going through the statements of the staff concerned of City Construction division, it was revealed that the storm water box drain on which the manhole under reference is located is under the comprehensive maintenance for a period of 7 years through Contractor M/s.Patel-Michigan (JV) appointed by the department of Deputy Chief Engineer(S.W.D.)City Const. The work under this comprehensive maintenance is exclusively carried out in two phases i.e. 1) Pre-monsoon phase - March to May and 2) Post-Monsoon phase - October to December.

The last comprehensive maintenance work was completed in all respects upto 31st May 2017 i.e. before onset of monsoon. As such, the department did not carry out any work at the incident location during monsoon period as per routine practice and scheduled program of SWD construction work.

Hence it is not required to open the manhole from June to September. It was also mentioned that no manhole cover or shaft cover was opened nor any other maintenance activities were carried out after 31st May 2017 and especially on 29th August 2017 in the storm water box drain stretch at the incident location.

It was also stated that, the safety measures i.e. barricading of manhole and deployment of staff around the manhole, are taken after opening of manholes that too only during Pre-monsoon phase - March to May and Post-Monsoon phase - October to December and are maintained till closing of the manhole.

As per the statements given by the staff concerned of Operation & Maintenance i.e.(O&M)S.W.D. division, the storm water drain at the incident location being under the purview of SWD City Const division, the incident manhole on the box drain was not opened by their staff on 29th August 2017.

6.2.2.1 Copy of Google map showing the S.W.D.Network along Senapati Bapat Marg and S. L. Matkar Road and details of the incident manhole such as size of manhole, material, size and thickness of cover

The google map shows the location of incident manhole. The size of the manhole is 0.9 m x 0.6 m, however, the size of the Mild Steel manhole cover is 1.00 m x 0.73 m having 16 mm thickness. The depth of the box drain below the road surface is about 3 mtrs.

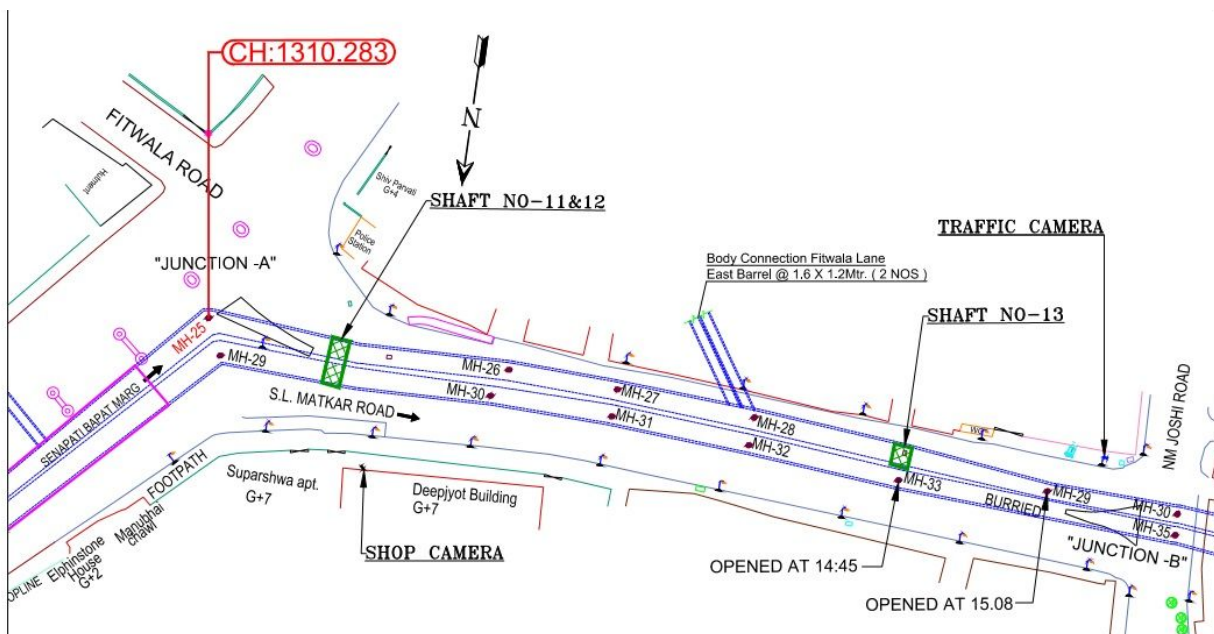
The map also shows the alignment of the existing box drain from Dadar Manish Market to Cleveland Storm Water Pumping Station. This map also shows the proposed augmentation of the box drain of size 2.5 m x 1.6 m having length of 80 m coming from Fitwala lane and crossing Senapati Bapat Marg and connected to the existing box drain

along S.L.Matkar Road. The said augmentation is proposed to address the flooding at Fitwala lane and will help in minimising the flooding at S.L.Matkar Road.

6.2.2.2 Plan showing details of storm water box drain and manholes passing along S. L. Matkar Road

The plan below shows the alignment of two stormwater box drains along Senapati Bapat Marg and S.L.Matkar Road with the junction of Senapati Bapat Marg with S.L.Matkar Road (marked as junction A) and the junction of S.L.Matkar Road with N.M.Joshi Marg (marked as junction B).

This plan also shows the incident manhole marked MH-25 and other manholes on the box drain.



6.2.2.3 Photos showing manhole at incident location visited by Enquiry Committee along with Assistant Commissioner G/South Ward and SWD Officials

(In photo below: The Enquiry Committee along with Assistant Commissioner G/South Ward and SWD Officials visited the incident spot on 06.09.2017 to understand as to how the incident could have occurred.)



A second photo in closeup position shows the incident manhole in open condition, wherein it can be seen that the manhole cover is chained to the manhole chamber with iron/steel chain so as to avoid theft.



6.2.2.4 Photo of manhole at incident location and a photo taken from bridge

The photo shows the incident manhole in closed position nearby the traffic island while a photo taken from bridge showing the exact location of the incident manhole corresponding to the traffic island and bridge.



6.2.2.5 Enquiry Committee's visit to residents of Suparshwa Apartment for getting information about the incident happened on 29th August 2017 :

The residents who gave interviews on various TV channels about the incident were identified by the Enquiry Committee through G/South Ward staff and were requested to come for statements to be recorded by the Enquiry Committee. The concerned have however not shown their willingness for the same. Hence the Deputy Municipal Commissioner (Improvement) along with members of Enquiry Committee visited residents in Suparshwa Apartment situated at the Junction A and adjacent to the incident spot on 13.09.2017, to understand the factual circumstances that happened on the incident day. They were requested to at least interact with the Committee members, which they obliged.

The Committee met Mrs. Renuka Jain, the resident of flat no. 402, fourth floor in A Wing of Suparshwa Apartment. She stated that while the actual incident of the person falling in the drain was not seen by her as she was busy in day-to day chores but when she looked out of the balcony for checking the arrival of her son from work, she saw an open umbrella floating in the water near the incident location. She informed that she was not aware as to who has opened the manhole cover. She stated that there was a bamboo/stick placed in the open manhole and some people seating in the nearby vehicles were guiding people to cross the road which was under water. She stated that some people rushed to the manhole after the person fell in it and tried to rescue him, but they could only find the umbrella floating on water.

She was requested to give her written statement of what she saw on the incident day about happenings around the incident location, which she declined.

Thereafter, another resident Shri Vikesh Jain, flat no. 401, fourth floor in A wing of Suparshwa building was also requested to interact with the Committee. He has also given some interviews on TV channels about the incident. He stated that he was not present at the spot at the time of the incident, but had learnt about it from the

eyewitnesses and spoke about the same to the channels. He was not aware as to who opened the manhole covers. He informed that whenever MCGM staff open the manholes during flooding they man it with some staff who remain stationed there till it is closed. The other citizens who are seen in various TV interviews did not come forward to meet or give their statements.

6.2.2.6 Working of Cleveland Storm Water Pumping Station on 29th August 2017

As per the report of E.E. (M&E) SWD Projects-1, Cleveland Storm Water Pumping Station (SWPS) has 7 nos of pumps each having a discharge capacity of 6 cu.m./sec i.e. 6000 litres / sec. The maximum level to be maintained at SWPS is 24.20 metres and the pumps cannot be operated if the level of water is below 23.5 metres.

On 29th August 2017, it is seen that maximum 5 nos. of pumps were operated simultaneously throughout the day.

It is also reported that when the mitre gates are opened, pumps are not operated at SWPS. However to give fast relief to the flooded area, 2 to 3 pumps were operated simultaneously throughout the night leading to fast receding of flood water from the affected areas.

On 29th August 2017, 1090 million litres of water was pumped into the sea by Cleveland SWPS.

6.2.2.7 Report of Catchment area no.129 (covering the incident location)

The incident location falls in the Catchment area no.129 of Draft BRIMSTOWAD-II Master Plan. Various works of augmentation of the stormwater drain network have been suggested in the Catchment no.129 report. The said works are required to be undertaken as per priority to be decided by Chief Engineer(SWD).

6.2.2.8 Plan showing sewerage rising main passing along Senapati Bapat Marg and S. L. Matkar Road

It is mentioned in the plan that there is a sewerage rising main passing along Senapati Bapat Marg and S.L.Matkar Road and that there are no manholes on the rising main.

6.2.2.9 Details of flooding at the incident location from 2013

From the list of flooding complaints at Senapati Bapat Marg-S.L.Matkar Road junction where the incident manhole is located, it is seen that there has been no complaint of flooding at the incident spot for the last 4 years. However, as per report of Assistant Commissioner G/South, S.L.Matkar Road was flooded on 18th and 19th June 2015 due to operational problem of flooding gate of Cleveland Bunder Pumping Station.

6.2.2.10 Work done by Dy.Ch.E.(O & M) S.W.D. Department

The labour staff of O&M (S.W.D.) reached near Senapati Bapat Marg near Indiabulls Sky building on 29th August 2017 after their rounds in various parts of the G south ward.

They had opened manhole on Senapati Bapat Marg opposite Indiabulls Sky building around 10:00 pm and closed the same around 11:30 pm. The photographs of the labour staff standing at these manhole spots was taken by Assistant Commissioner G/South. The labour staff are seen wearing yellow waterproof jackets and pants. The MCGM staff have shown due diligence in the opening, manning and closing the manhole covers.

6.3 Communication with Dr. Mrs. Amarapurkar for inputs about the incident

Deputy Municipal Commissioner (Improvement) tried to communicate with Dr. Mrs. Amarapurkar through Dr. Nitin Dange of K.E.M. Hospital, who was in touch with her since the incident, for getting her appointment so that Shri. Vijay Singhal, I.A.S., A.M.C.(E.S.), Chairman of Enquiry Committee could meet her and offer condolences and get first hand information from her on various aspects before the incident happened. She however intimated that she is out of town and not willing to meet the Committee. Hence D.M.C.(Health) Shri Sunil Dhamne was requested to arrange a meeting with her which also could not be arranged as she was not ready to meet. Lastly a message was sent by Deputy Municipal Commissioner (Improvement) to Dr. Mrs. Amarapurkar on 12th September 2017 requesting her appointment at her residence for offering condolences and getting some inputs about the incident, which she politely but firmly declined. The details are in box file at page no. 403.

6.4 Communication with Architect Shri. Pravin Naik for inputs about the incident

As Dr. Mrs. Amarapurkar declined to meet the Enquiry Committee, Architect Shri Pravin Naik, whose wife is a colleague of Dr. Mrs. Amarapurkar, was messaged to give inputs about the incident as he had given interview on some TV channels about this incident. He seems to know various facts about the incident. He assured to meet the Committee but could not manage to come for the same as he was to travel to USA the evening very next day. Therefore no inputs could be obtained from him too. The communication is in the box file at page no. 405.

6.5 Rainfall data of date 29th August 2017

From the rainfall data of 29th August 2017 of G/South Ward, rainfall of high intensity 59.19 mm between 11:00 am to 12:00 midnight, 45.98 mm between 12:00 noon to 1:00 pm and 64.51 mm between 3:00 pm to 4:00 pm is observed.

6.6 List of chronic flooding spots in Mumbai

Out of 36 chronic flooding spots in city area of Mumbai, Fitwala lane is the only one flooding spot in G/South Ward.

6.7 Letter to Vodafone regarding the location and call details of Dr. Amarapurkar on 29th August 2017

D.M.C.(Improvement) on behalf of Enquiry Committee wrote a letter dated 4th September 2017 to Vodafone requesting to provide location and call details of Dr.Amarapurkar on 29th August 2017 so as to find out his location at various points of time to co-relate the same with alleged incident. They have however not responded to the Committee's request. It is informed that they do not share such personal information with anyone except authorised Police officer.

6.8 Letter to Sr. Police Inspector, Dadar Police Station for providing copy of Police Panchnama, photos of the dead body and any other relevant information regarding the incident as well

as details from Vodafone about the call details with locations of Dr. Amarapurkar on 29th August 2017

D.M.C.(Improvement) on behalf of Enquiry Committee wrote a letter dated 4th September 2017 to Senior Police Inspector, Dadar Police Station requesting to provide copy of Police Panchnama, photos of the dead body found at Worli sea face near Cleaveland Pumping Station waterfall i.e. outfall and any other relevant information regarding the incident as well as get details from Vodafone and provide the call details with locations of Dr.Amarapurkar on 29th August 2017 so as to find out his locations at various points of time to co-relate the same with alleged incident. DMC (Imp) followed up with Senior Police Inspector, Dadar Police Station by sending him reminder messages for the same.

The Senior Police Inspector, Dadar Police Station replied vide his letter dated 08/09/2017 stating that they cannot share any information with the Committee as the matter is under investigation.

Another letter was sent under the signature of A.M.C. (E.S.) Shri. Vijay Singhal to Additional Commissioner of Police for directing the Police station to provide whatever documents that can be shared with the Committee, but the same cannot be provided as told verbally by Addl.C.P.

6.9 Letter to Sr. Police Inspector, Dadar Police Station for providing copy of post mortem report related to Dr. Amarapurkar

D.M.C.(Improvement) on behalf of Enquiry Committee wrote a letter dated 6th September 2017 to Senior Police Inspector, Dadar Police Station requesting to provide copy of post mortem report along with histopathological report related to Dr.Amarapurkar.

6.10 Letter from Police Authority denying photos and other documents

Senior Police Inspector, Dadar Police Station vide his letter dated 8th September 2017 to Assistant Commissioner G/South Ward informed that on 30th August 2017, a missing complaint of Dr. Deepak Narayan Amarapurkar was registered by his sister, Smt.Manisha Narayan Amarapurkar and on 31st August 2017, Dr. Amarapurkar's dead body was found at Cleveland drain, Worli. He further informed that as the matter is under investigation, it would not be possible for them to provide the photos and other documents requested by the Enquiry Committee. The Additional Municipal Commissioner ES also wrote to Additional Commissioner of Police to provide whatever information is possible to be shared however it is communicated that this information can not be shared as of now (copy in the box file at page no.427, 428).

6.11 Letter to Assistant Commissioner of Police (Operations) for providing CCTV footage of cameras at and near the incident location

D.M.C. (Improvement) on behalf of Enquiry Committee wrote a letter dated 8th September 2017 to Assistant Commissioner of Police (Operations) requesting for the CCTV footage of cameras provided at Dhanmill naka, Senapati Bapat Marg, Fitwala Road, S.L. Matkar Road of 29th August 2017 from 2:00 pm to 7:00 pm, which was duly provided by Assistant Commissioner of Police (Operations) vide letter dated 15th September 2017.

6.12 Note to Dean, Sion Hospital for providing copy of post mortem report related to Dr. Amarapurkar

D.M.C. (Improvement) on behalf of Enquiry Committee sent a note dated 4th September 2017 to Dean, Sion Hospital to provide copy of the post mortem report along with histopathological report related to Dr. Amarapurkar. The Dean Sion however informed that they had written to the Dadar Police Station for issuing NOC for sharing of the post mortem report with the Committee which they did not get from the Police authority and so did not share the same.

7.0 Probable Cause of the incident

7.1 T.V. News Channel clippings about the incident

D.M.C.(Improvement) on behalf of Enquiry Committee requested M/s Gold News Monitoring Services Pvt Ltd for providing TV channel clippings about this incident covered by various channels. They have provided clippings of ABP Majha News, ABP News, Jai Maharashtra News, NDTV News, News Nation, News World India and Zee 24 Taas covering the incident of the death of Dr. Amarapurkar. This information was used to find out details of eyewitnesses or persons who can give some information useful for the enquiry. The photographs and video taken from this was used to locate the persons concerned.

The concerned persons however have shown reluctance to meet, give statements and providing information to the Committee.

7.2 CCTV footage received from Assistant Commissioner of Police (Operations)

The Assistant Commissioner of Police (Operations) was requested to share the CCTV footage of 29th August 2017 between 2:00 pm to 7:00 pm, which covers the S. L. Matkar Road. The camera is installed on edge of the footpath on south side of the road as shown in the plan in box file at page no. 299 at the T- junction of S. L. Matkar Road and N. M. Joshi Marg (Junction B) and is facing towards junction of S.L. Matkar Road and Senapati Bapat Marg (Junction A) where the incident happened. A tree is seen in front of the camera which obstructs the view of the camera of the manhole at junction A, where the incident happened.

It is seen from the footage (clip nos.29091416, 29093509) of camera No. cp02fc03 available from Police Department that a group of four to five people, who probably stay on this road, have started to unauthorisedly open the storm water drain manholes, starting apparently from junction A and moving towards junction B. They are having an iron bar which is used to open the manhole cover. They are seen opening two manholes between the junction A and B mentioned above. A water vortex is formed due to fast flowing water after opening the manholes. From the sequence of events and timings of their opening these manholes, it can be inferred that they opened the manhole MH-25 at junction A where the incident took place and then moved to open the second manhole MH-33 and then the third manhole marked as MH-29 near junction B on the plan in box file at page no.299.

They seem to have deserted the place when the rain intensified and flooding depth increased. They left the manholes open without replacing the covers back to their original positions. This can be inferred from the movement of water into the open manhole at MH-29 near junction B after they left the spot. The faces of the persons who

opened the manholes are clearly recorded in this footage in the Police Department's CCTV.

7.3 CCTV footage of M/s Kumar Cargo Service, shop no 10, Deepjyot Building

The societies and shops on S.L.Matkar Road were issued letters to provide CCTV footage from their societies/shops on the day of incident. Only one shop owner has provided the footage which is very useful to infer that the same group of people who were seen opening the manholes nos. MH-33 and MH-29 near junction B in the CCTV footage of Police camera no. cp02fc03 also opened the manhole MH-25 at junction A. The persons seen in camera no 1 seems to match with the camera no. 2 of the same shop, which further seems to match with the camera no. cp02fc03 of Police department at junction B. From viewing of these three camera footages, it is apparently clear that it is the same group of people who unauthorisedly opened all the three manholes MH-25 as well as MH-33 and MH-29 near Junction B. After observing the footage of the cameras provided by the shop, it is seen that, though the footage is of the incident date i.e. 29th August 2017, the date seen recorded on the footage is 28th August 2017, as their camera date is one day behind because of internal setting as per his letter enclosed in the box file at page no.202.

7.4 Incident of Falling of man holding an umbrella in manhole no. MH-25

From sequence of events seen in the three CCTV cameras as mentioned above it can be inferred that one man who is crossing the junction of the Senapati Bapat Marg and S.L.Matkar Road (junction A) fell in the manhole which was unauthorisedly opened by the group of people who are seen in the CCTV footage of the Police and one of the shops mentioned herein.

7.5 Report submitted by Disaster Management Department to Municipal Commissioner

The Chief Officer (D.M.P.) has submitted a report dated 06/09/2017 about flooding and has made various observations and noted some shortcomings during heavy rainfall of 29/08/2017 as in the box file at page no. 361 to 378. In the said report, he has mentioned that the heavy rainfall of 331 mm in 24 hours like 29/08/2017 had happened first time in last sixteen years. He has mentioned that the high tide level was 3.29 mtrs at 04:52 am and 3.23 mtrs at 16:23 whereas the low tide level was 2.35 mtrs at 10:32 and 1.68 mtrs at 22.59. He mentioned that the difference between the low and high tide level was very less hence the flood gates at Haji Ali, Cleaveland, Britannia Pumping stations were not opened even during the low tide as level of seawater was more than the water levels in nallas. This caused slow receding of flood waters in the city.

7.5.1 Observations regarding other departments during heavy rainfall

The Chief Officer (D.M.P.) has mentioned that the Colaba meteorological observatory advisory for 28/08/2017 was for intermittent rain or showers with heavy to very heavy rainfall at a few places likely to occur in city and suburbs and for 29/08/2017 was intermittent rain or showers with heavy to very heavy rain falls at few places likely to occur in city & suburbs. It was expected with this prediction that rains up to 204 mm in 24 hours may occur and accordingly they had taken necessary actions. However the rainfall from 29/08/2017 to 30/08/2017 was 333 mm which falls in Extremely Heavy category. Though the prediction was heavy rainfall at few places, actually there was more than 200 mm rainfall at 26 raingauge stations. If prediction would have been for Extremely Heavy rainfall, then SOP for the same would have been activated and

citizens would have been intimated in advance with bulk SMS's and rescue teams would have been posted in anticipation at vulnerable spots.

The Chief Officer (D.M.P.) has therefore requested that specific prediction by the Colaba meteorological observatory for Mumbai instead of a clubbed prediction for Konkan region be insisted. They have suggested that a representative of Meteorological Department should attend Disaster Control Room at M.C.G.M. for smooth and better coordination. It is observed by Chief Officer (D.M.P.) that the Doppler Radar was not working on many occasions and the Meteorological Department should take necessary actions.

The Municipal Commissioner has directed to fix a meeting to coordinate with all the concerned and take cognisance of these suggestions of the DMP in this enquiry report.

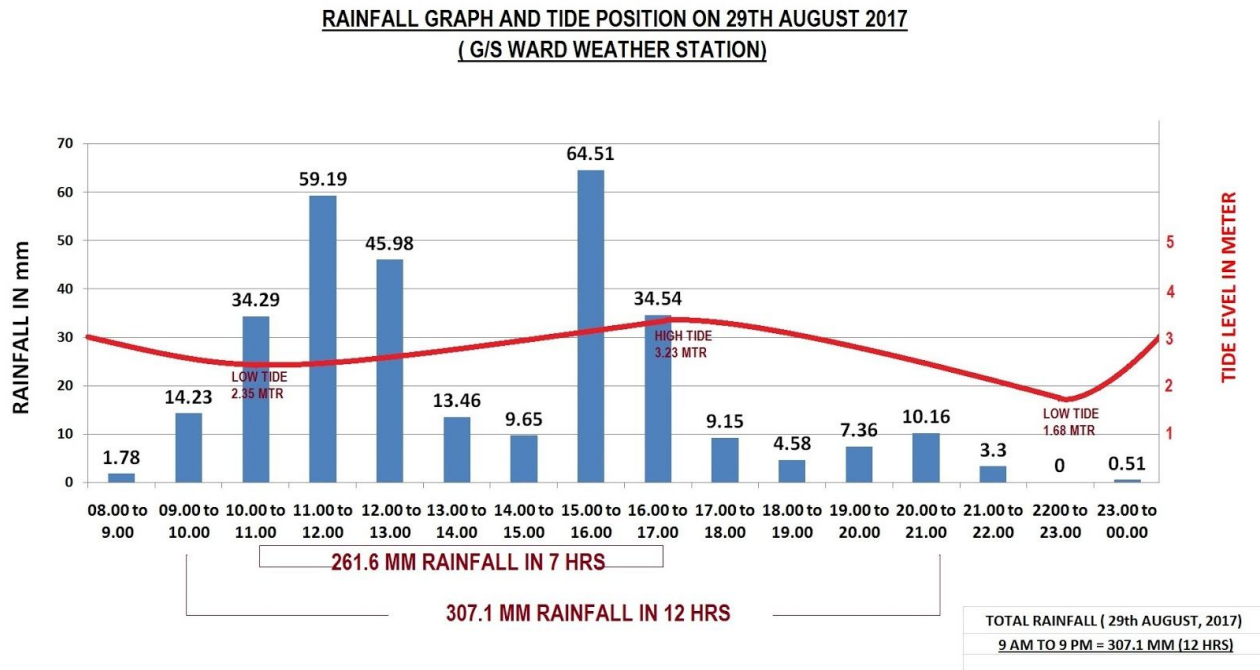
8.0 Fixing Responsibility for the incident

8.1 Works carried out by MCGM staff on 29th August 2017

From the detailed report submitted by the Assistant Commissioner G/South ward and Dy.Ch.Eng.(S.W.D.) City Const. and Dy.Ch.Eng (O & M) S.W.D. staff, it is seen that their staff has not opened the manhole where the incident happened. They were busy whole day tackling various complaints received by them about flooding, tree fall etc all over the ward due to very heavy rainfall which caused flooding in many areas in the ward. The rainfall during cloudburst on 26/07/2005 had recorded only 73 mm in city area and hence the flooding during that time in city area was not as severe as it was seen this time whereas the rainfall on 29/08/2017 in G/South Ward was 320 mm coupled with neap tide which caused severe flooding.

8.1.1 Neap tide effect

As explained in the report of the DMP mentioned above, the heavy rainfall intensity coupled with the Neap tide caused prolonged and heavy flooding in most part of the city ward. The difference in the low tide and high tide was very less and hence the discharge of the stormwater in the sea was very slow. The gates of Storm Water Pumping Station at Cleveland were operated accordingly keeping in view the neap tide effect. The graphical representation of the rainfall and tide levels on 29/08/2017 below shows the relation of intensity of rainfall and the tide levels and how it had affected the receding of storm water drain in G/South Ward’s jurisdiction.



The staff of G/South Ward office, Dy.Ch.Eng.(S.W.D.) City Const, Dy.Ch.Eng.(O & M) S.W.D. performed their duties as expected during such heavy rainfall. They have not received any complaint about the manholes unauthorisedly opened by some citizens and hence could not attend the incident spot to guard or close the manhole.

After going through various documents, CCTV footage, statements of different staff, citizens and analysis of the same, it is felt by the Enquiry Committee that, no staff of M.C.G.M. can be held responsible for this incident in view of above facts. It is unfortunate that without going into facts and merit of the case, the Federation of Retail Traders Welfare Association has made unsubstantiated and unfounded allegations against M.C.G.M. to malign the image of the institution. This fact also needs to be enquired into.

8.2 Unauthorised opening of manholes by group of citizens on 29th August 2017

From the sequence of events which is elaborated above with the help of CCTV footage available from Police and a shop owner, it is evident that a group of citizens unauthorisedly opened the manhole covers. It appears that they deserted the locations of the open manholes without closing the covers. The Police authorities need to investigate and take appropriate action against concerned people.

9.0 Conclusion

It is observed that on 29/08/2017, there was extremely heavy rainfall in Mumbai, in general, and the surrounding area of G/South Ward jurisdiction, in particular. There was neap tide due to which the difference in low and high tide level was only 0.88 mtrs leading to substantial flooding. The graphical representation of the tide levels and rainfall on 29/08/2017 shows this clearly as described in above paragraph at 8.1.1. The gates of the Cleaveland Storm Water Pumping Station could not be opened for almost 14.50 hours due to the neap tide effect which delayed discharge of the stormwater in G/South Ward.

The staff of G/south Ward and S.W.D. Central agency were on duty and attending various spots where complaints of flooding and tree fall were received. They were busy attending major spots of flooding or where traffic was getting affected due to flooding like the Worli Sea link. The job slips of the staff concerned and their statements show that the staff of M.C.G.M. did not open the manhole on S.L. Matkar Road where the incident of Dr. Amarapurkar falling in the open S.W.D. manhole has happened. Thus the staff of M.C.G.M. is not responsible for this incident.

From the CCTV footage made available by the Police department and the shop owner at S.L. Matkar Road, it can be inferred that the group of four to six people have opened the manhole, where Dr. Amarapurkar fell in the open S.W.D. manhole. The concerned group did not replace the cover of the manhole back in its original closed position and left the place. The Police authorities need to investigate and take appropriate action against concerned people.

10.0 Proposed action to be taken to avoid such incidents in future

10.1 Public advertisement published by MCGM on 09.09.2017 in local newspapers calling for suggestions for manhole improvements

In view of this incident it was felt necessary to get some creative solutions for avoiding such incidents in future and also to make general public aware about this issue.

M.C.G.M. published an advertisement in the daily edition of 9th September 2017 of Lokmat (Marathi edition), Navbharat Times (Hindi edition), Mumbai Samachar(Gujarati edition) and The Asian Age (English edition) inviting suggestions from citizens and public organisations/NGO to suggest remedial measures / to give their suggestions within seven days on M.C.G.M.'s intentions to take preventive measures to avoid mishaps due to the open manhole covers of storm water drains and sewer lines on the roads (especially during the monsoon).

In response to this, only two responses have been received till 18/09/2017, out of which one is from an employee of M.C.G.M. They will be studied by the concerned as per the recommendations herein contained in this report and most suitable mechanism will be adopted for implementation.

10.1.1 Shri. Satyajit Patil, AE (SWM) M/West Ward has suggested to put RFID tag to manhole covers, so that in case the cover gets displaced from its original position, a message will go to Disaster Control Room

He has further suggested to provide net/mesh below the manhole cover so that if the manhole cover gets displaced, the net / mesh layer will prevent falling while not affecting ingress of water or any maintenance work (in the box file at page no. 417).

10.1.2 Shri. Deepak Hedulkar has also suggested to provide net below the manhole cover

He has suggested to arrange the seating of the manhole cover in such a way that the manhole cover will open about 4 to 5 inches only, irrespective of the internal pressure on the cover, which may lead to some injury but will prevent any fatal incident.

He has further suggested to provide grated covers, but after studying the effects of smell and gases.

He has finally suggested to provide arrangement for deployment of gas balloons upto 4 to 5 feet height on displacement of manhole cover (in the box file at page no. 419).

10.1.3 Some suggestions circulating on social media

10.1.3.1 There is a suggestion from Shri. Ketan Kadam about the use of a bucket shaped metal frame to be fixed in the manhole just below the manhole cover so that water will be allowed to pass smoothly, but will prevent fall of any person in the manhole. The suggestion needs to be studied and verified by the SWD and SO department about its usefulness and practicability. The photographs of the suggested mechanism are at next page.



10.1.3.2 Wire mesh over the manhole/grated cover over the manhole

There is a suggestion by Shri Jatin Khandwala, seen on facebook which suggest putting a wiremesh type of cover on the manholes. This also needs to be studied by the concerned department from safety point of view taking into consideration the heavy vehicular load that it is supposed to withstand. The photographs of the same are as below.



Above options shall be studied and viable/doable option shall be put forth / implemented by concerned departments.

11.0 Recommendations

This Committee on detailed deliberations with various stakeholders and study of various facts of this case is proposing following recommendations to avoid such incidents in future:

11.1 Mechanism for avoiding falling in open manhole

The Chief Engineer Storm Water Drain and Chief Engineer Sewerage Operations will study various suggestions received from various sources to avoid such incidents in future and select a most suitable mechanism which will not hinder their maintenance works and which will ensure that no person falls in open manholes.

The Committee is of the strong opinion that Jali type covers should be provided 5” to 6” below the main manhole cover so that, in case manhole is opened, though storm water will pass, a person will not fall in it. The possibility of having hinge manhole covers will be studied for its viability and practicality by this group.

11.2 Providing mechanical grabs at all pumping stations

It is observed that the citizens are throwing all types of garbage including plastic, thermocol, clothes and wood which clog the various storm water drains and screens at the pumping stations and reduce its efficiency.

The Director (ES&P) will ensure that all the pumping stations have mechanical automatic grabs for cleaning of garbage at the screens to enhance the pumping capacity during flooding in city to protect the equipment and ensuring their smooth functioning.

11.3 Expediting SWD work at Fitwala lane :

It is observed that syphon work has already been approved where water supply pipeline and storm water drain crosses each other which needs to be expedited on top priority to cover up missing link of 80 mtrs.

11.4 Police intervention during flooding

During flooding of more than 2-3 feet depth on any road, the Police will be requested to guide general public to cross such flooded locations and use alternative safe ways wherever possible on foot to avoid such incidents.

11.5 Mumbai specific detailed meteorological predictions

It is noted that the Colaba meteorological observatory is giving weather forecast which is lacking on three counts. The forecast is not quantitative but very subjective, it is also not area specific and it is worded extremely vaguely. Because of such forecast, the disaster preparedness is either under activated or over activated. This either causes panic or inconvenience to the citizens.

Therefore it is suggested that the Meteorological department should give specific forecast on the 3 counts as below :

- i) Time specific : the time range in which the rainfall is expected,
- ii) Area specific - the area or locality where the rainfall is expected, rather than mentioning “ at few places “ or “entire Mumbai City”.
- iii) Intensity - the intensity i.e. Heavy / Very Heavy / Extremely Heavy in quantitative terms.

The Meteorological Department should ensure proper functioning of the Doppler Radar.

11.6 Awareness campaign

The residents, shopkeepers in the vicinity of the flooding spots will be sensitised about unauthorised opening of manholes and they will be requested to intimate MCGM immediately if some citizens try to open such manholes.

General awareness messages through newspaper advertisements will be issued before onset of monsoon every year by Chief Officer DMP.

Sd/-	Sd/-	Sd/-
(21.09.2017)	(21.09.2017)	(21.09.2017)
(V. P. Chithore)	(C. D. Chore)	(Vijay Singhal, IAS)
Director (E.S. & P.) (i/c)	Dy. Municipal Commissioner (Improvements)	Addl. Municipal Commissioner (Eastern Suburbs)