

BRIHANMUMBAI MAHANAGARPALIKA
No.Ch.E./Vigilance/235/Conf./dt. 15.03.2019

SUB : Collapse of Footover Bridge between CST Railway Station & Times of India building on 14.03.2019.

By direction of Hon.M.C. Under No.MGC/A/7384 dt/ 15.03.2019 the report on Structural Audit conducted by Structural Consultant Prof.D.D.Desai's Associated Engineering Consultants & Analysts Pvt. Ltd. is as under:-

1. The Structural Auditors were appointed by MCGM to carry
2. out structural audit of various Bridges in City1 Division including the Bridge under subject matter. The Work Order was issued to the Consultants on 18.10.2016. From the reports it is observed that inspection was carried out on 26.12.2016 by the Consultants. Further Tests required for conditional assessment of the Bridge work were carried out on 4.07.17 and the final report was submitted to MCGM on 13.08.2018.
3. The Consultant has wrongly shown the year of construction of bridge in Proforma VI of the report as 1998, whereas, it has been informed that the construction took place somewhere in 1984-1986.
4. From the Bridge Inspection Report it is observed that the Structural Auditor has separately assessed the conditions of super structure, foundations and substructure. As per categorization done by him all the structural members of superstructure for the bridge are marked as number 1 i.e. GOOD, for the condition of paint, joints, deflection, cracks, spalling. Further, for the corrosion assessment in TRUSS 1, TRUSS2 & other defects the Consultant has marked as, to be monitored in next inspection.
5. Subsequently Consultant has conducted tests of Ultrasonic Pulse Velocity Test (UPV), Rebound Hammer Test, Carbonation Test, Thickness measurement of Steel members by ultrasonic Gauge, Dye Penetration Test on steel members. Based on the above tests, the Auditor has concluded that the concrete quality is classified as GOOD as per UPV Test. Most of the Test results of Rebound Hammer Test range in concrete grade from M20 to M30. As per Dye Penetration Test, conducted on the steel members are found to be O.K. without any surface defects like cracks, flaws, voids etc.
6. Further, the Auditor vide his note dt. 6.08.2018 has submitted a final report for the 39 bridges in City Zone South, wherein he has given findings in the form of categories of these Bridges as G for G, Minor Repairs as MR, Major Repairs as MJR and Demolition & Repairs as D&R. The Department of Bridges has reported that G category is for Bridges in GOOD condition. As per the above report, the Times FOB D.N. Road, Near Times of India, CST at Sr.No.18 shows the

findings as G i.e. FOB in Good Condition.

6. The Bridge department has reported that a total of 296 structures comprising Bridges, FOBs, ROBs are audited in which Auditors have reported that 110 are in Good condition, 107 requires Minor Repairs and 61 requires Major Repairs. Auditors have recommended 18 structures for demolitions and reconstruction. Bridge department has reported that all structures except 110 in Good condition are proposed for repairs as per the recommendations of the Auditors and the proposals are at various stages of approval. In some proposals work orders are already issued. In case of the Bridge under subject matter, the same is not taken for any repairs as Auditor has categorized it as in GOOD condition and has not recommended any specific repairs.

FINDINGS:-

- 1. The Structural Auditor has not raised any alarm for anticipated failure of structural members and not recommended any specific need for repairs.
- 2. The Auditor has reported that conditions of joints, deflections, cracks, spalling etc. in GOOD conditions.
- 3. Auditor has reported that the critical structural items i.e .concrete and steel members are in GOOD condition and without any defects like crack, flaws, and voids etc.
- 4. The report suggests overall condition of the Bridge as GOOD.

CONCLUSION :-

Prima-facie it is reasonably concluded that the structural audit is not carried out correctly and major lapses are observed in conducting the Structural Audit of the Bridge on the background of sudden collapse of the Bridge on 14.03.2019 i.e. within a short period of submission of the Report on 13.08.2018.

In view of the above, suitable action against the Structural Auditor for his casual approach while performing the structural audit is proposed.

In the matter of MCGM staff, the following points are observed :-

- 1. The Bridge department has provided the details of work carried out for CSMT Bridge in the bi-annual contract for the year 2012-2014.
- 2. M/s.R.P.S. Infrastructure Pvt. Ltd. Has carried out the structural repairs to the said Bridge wherein the works such as polymer modified mortar, EPOXY painting, SSHandRailling & Structural Steel Work of about 1.4 M.T was carried out.
- 3. However, since the collapse of the Bridge has taken place within 6 years from the repairs being carried out, it seems that the supervision during the work and the workmanship of contractors was not upto the mark.
- 4. It is also observed that due care and proper supervision appears to have been not done during the process of structural audit.

In view of above, the responsibilities of staff responsible for execution of repair work during 2013-14 and staff responsible for poor supervision of structural audit in 2017-18 needs to be fixed. Therefore, it is proposed to conduct FFDE of the following staff from the list submitted by Ch.E. (Bridges) :-

- (I) The then Chief Engineer (Retd.) Shri S.O. Kori
- (ii) The then Dy.Ch.E.(Bridges) (Retd.) Shri R.B. Tare
- (iii) The then E.E.(Bridges) Shri A.R. Patil and Shri A.I. Engineer. *JA*
- (iv) The then A.E.(Bridges) Shri S.F. Kakulte

5. Further, action to be initiated against the contractor M/s.RPS Infraprojects Pvt. Ltd. by issuing show-cause notice for sub-standard work of repair to the Footover Bridge carried out in the year 2012-2014.

Submitted please.

JA
15/03/19
Chief Engineer(Vigilance) *JK*

Hon. M.C.
Sir,

*Pls see order attached
at pg N/7 to N/9.*

Ajay Malhe
15/3/19
Municipal Commissioner

AMC(ES)

~~Confidential~~

बृहन्मुंबई महानगरपालिका आयुक्तांचे कार्यालय	
15 MAR 2019	
संग	११, १२, १३, १४ १५, १६, १७, १८
क्रमांक	MGCIA/7384

15/3/19

BRIHANMUMBAI MAHANAGARPALIKA

MGC/A/7384 Dt 15/03/19

On perusal of the preliminary report of Chief Engineer (Vigilance) on the collapse of CST railway station and Times of India Bridge on 14.03.2019, it is apparent that structural audit report has failed to point out an impending failure.

The structural audit report states that the bridge is in good condition and only minor repairs are required but fails to elaborate the nature and the locations of the minor repairs to be carried out. The structural report on the other hand has certified most of the bridge to be in good condition. There is *prima facie* reason to believe that the structural audit has been conducted in an irresponsible and negligent manner. This structural report should be made public. The structural report appears to have completely overlooked the critical elements of the bridge and their condition leading to this sad tragedy. In spite of commissioning the structural audit report of the Bridge and spending public money on it, the true condition of the bridge was not brought out. This tragedy could have been avoided if the structural audit had been done diligently.

In view of the above and to prevent any further tragedies, the following action be taken.

- (1) The structural auditor of this bridge, Professor D.D. Desai's Associated Engineering Consultants & Analysts Pvt. Ltd. be immediately de-empanelled from the empanelled list of structural auditors of MCGM and the same be also informed to the Govt. of Maharashtra together with the reasons thereof.
- (2) The structural auditor company be issued Show Cause Notice for blacklisting and preventing them from taking any future structural audit work.
- (3) All ongoing works allocated to this structural auditor firm should be withdrawn forthwith and be allotted to an alternative structural auditor.
- (4) The works which the said company has completed structural audit be once again audited through a different structural audit company.
- (5) In view of the apparent neglect and irresponsible nature of the structural audit report which has led to collapse of the bridge and loss of human lives, an FIR be filed against the structural auditor, Professor D.D. Desai's Associated Engineering Consultants & Analysts Pvt. Ltd.
- (6) All payments pending to be made to this structural auditor be stopped forthwith and for any payments made earlier, due process of recovery be started.
- (7) All bridges that were taken up for structural audit work vide order No. ChE/3816/bridges dated 29th August 2016 other than this firm should be reaudited by the same structural audit firms which had conducted the earlier audit. The structural audit firms should be asked to reexamine their audit reports in light of yesterday's (14.03.2019) bridge failure and submit reports confirming their earlier findings or suggest further remedial measures as may be necessary. These structural audit firms may also be informed that no payment will be made for this reexamination.

Ng

In view of the fact that the Municipal Corporation operates approx. 374 bridges, it is now necessary to have a fullfledged Chief Bridge Inspector. The Chief Bridge Inspector shall be made incharge of a Bridge Inspection Authority within the Corporation. Broadly this Bridge Inspection Authority would perform the following tasks, viz.

- (a) Define and set the frequency at which various bridges should be inspected.
- (b) Enumerate the inspection to be carried out on different frequencies.
- (c) Define the template and formats in which reports would be submitted.
- (d) Define responsibilities of various bridge maintenance engineers.
- (e) Recommend such remedial actions in case the bridge is in a dangerous condition.

Director (ES&P) will prepare a plan to set up of this Authority within one month.

On the matter of fixing responsibility of the MCGM staff and engineers, the report of the Ch.E.(Vigilance) points a very serious lapse that appears to have taken place in the year 2013.

The Ch.E.(Vigl.) has pointed out that in the year 2013, the work of repairs of this bridge was carried out in which nearly 1.43 tons of structural steel has been used. Further some painting work, polymer modified mortar work and hand railing work also appears to have been done. This clearly indicates that an attempt was made to carry out substantial repairs on the bridge in the year 2013. If such major repair works were carried out, it is surprising to note how the then engineers failed to identify and attend to issues that could lead to collapse of the bridge. Not only have they failed to identify but they have also neglected to carry out repairs on the same. *Prima facie*, it appears that this work has been carried out without any due examination or study of the bridge condition.

The Ch.E.(Vigilance) also points out that poor quality of the structural audit report is an indication of lack / absence of supervision of the audit work. The engineer under whose charge this audit took place should also be held responsible. In view of above, I pass the following Order.

- (1) The staff responsible who have been named in the report of Ch.E.(Vig.), i.e. Executive Engineer Shri A.R. Patil who was supervising the structural audit work in 2017-18 be forthwith placed under suspension. The Asst. Engineer, Shri S.F. Kakulte who was supervising the repair work in 2013-14 be placed under suspension forthwith. Further FFDE be carried out against them.
- (2) The other staff, the then Ch.E.(Bridges) Shri S.O. Kori and the then Dy. Ch.E. Shri R.B. Tare who have retired to face FFDE and charges be framed accordingly. So also Executive Engineer, Shri A.I. Engineer to face FFDE.
- (3) The contractor M/s. R.P.S. Infrastructure involved in this work should be issued Show Cause Notice for blacklisting.
- (4) All the files of this subject be put up in public domain.

Aji Malika 15/3/19
Municipal Commissioner

A.M.C.(E.S.)
Director (E.S.& P.)
Ch.E.(Bridges)