



**REPORT OF THE
ROAD DEVELOPMENT AND ROAD
MAINTENANCE COMMITTEE**

AUGUST 2016

PUNE MUNICIPAL CORPORATION

Report of Road Development and Road Maintenance Committee

The Municipal Commissioner, PMC appointed this expert Committee vide order No MCO/35 dated 09/04/2016 to provide expert guidance on the issues faced by the Road Department of Pune Municipal Corporation for road development and maintenance. The committee has completed its task and is pleased to submit the report.

Shri Ajit Pawar, Chairman, STAC- RDRMC Chairman -----

Shri Sudhir Janjot, Chairman, CIC- Member. -----

Shri Pramod Bongirvar, Member, STAC – Member. -----

Shri Vivek Velankar, Sajag Nagrik Manch – Member. -----

Shri Prashant Inamdar, Pedestrians First – Member. -----

Shri Vikas Thakar, Member STAC – Member. -----

Shri Dnyaneshwar Molak, Jt Commissioner, PMC – Member. -----

Shri Rajendra Raut, Chief Engineer (Roads) – Member. -----

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FOREWORD

The Pune Municipal Corporation faces severe criticism from the public and press for poor maintenance of its roads and inconvenience caused to the general public especially during the monsoon season. Many NGO's and groups have pointed out the fallacies in the working system of the Roads Department, which leads not just to poor upkeep and maintenance of roads but also to wasteful expenditure on many occasions. The issue of rampant construction of concrete roads in the city over the past few years has also received flak from various sections of the society. City roads are dug up for hundreds of km length to house new utility services and do not get restored to their original condition over an unduly long period. All these anomalies in the working of the Roads Department result in not just only inconvenience but lead to various safety hazards and many fatal accidents.

Despite availability of various expert committee reports and guidelines addressing the road development and maintenance issues, the problems persist and are recurrent in nature thereby causing embracement to the Pune Municipal Corporation as a body. Road development and maintenance works are carried out by the Main Roads Department of PMC along with the Ward Offices. Road Department and ward offices have to deal with various other stakeholders in their task of keeping the road infrastructure in tact such as Water supply, Sewer lines, electrical department of the PMC, various OFC service providers, MSDCL, MNGL and other entities, because these entities lay their service lines along the roads. There is evident lack of coordination between various internal and external departments and which poses various hindrances in implementation of standard norms brining the road infrastructure towards disarray.

Taking cognizance of this situation, Municipal Commissioner, PMC vide his Office Order MCO/35 dated 09/04/16 constituted the Road Development and Road Maintenance Committee (RDRMC). Committees have been entrusted with the task of reviewing the current road development and maintenance scenario, identification of key lacunae in the current system and implementation of standard guidelines and suggest practical solutions to stem out the impending problems related to road infrastructure maintenance and upkeep and safety standards.

SUMMARY OF RECOMMENDATIONS

1. The summary of recommendations for immediate implementation by the top management of PMC is given below.
 - 1.1. For decision regarding the construction of concrete roads, other Important aspects like **utilities, temperature, noise, roadside trees, water percolation, citizen opinion**, etc. should be considered along with the other technical parameters like lifecycle cost, reduced maintenance etc.
 - 1.2. **Clear demarcation of responsibilities** for road construction and maintenance activities with reference to width of roads between the **Main Road Department and Ward Offices** should be done.
 - 1.3. **Adequate budgetary provisions** taking into account the Prevailing norms of requirement of funds should be ensured. Efforts should be made to ensure that revenue generated by Roads Department is set aside and provided to the Roads Department only. This is a common practice in State/Central Government where toll revenue generated by the Roads department is made available to the same department. Special attention is invited to the budgetary provisions made for reinstatement works, which are seldom commensurate with the permissions given for trenching work.
 - 1.4. **Policy for appointment of Third Party Audit agencies** and Project Management Consultants should be framed and strictly implemented.
 - 1.5. **Performance evaluation system for Contractors, Consultants** and Third Party Audit Agencies should be framed and strictly implemented.
 - 1.6. **Roles and responsibilities of PMC Engineers** should be clearly defined in case of projects where Consultants and Third Party Audit agencies are deployed. A suitable form needs to be incorporated as an Annexure to Confidential Reports of the officers to evaluate the performance of the concerned officers on this count. Failure in this respect needs to be viewed very seriously.

- 1.7. Provision for civil works, which are required to be carried **(barricading, safety signage etc.) to ensure safety norms should invariable form part** of the estimate of each work.
- 1.8. A **Planning and Central Coordination cell** needs to be established for overall management of the road infrastructure within the city.
- 1.9. **GIS mapping of all roads showing all the over ground and underground services** and incorporating other technical and physical parameters should be the topmost priority. This would act as a decision making tool at the time of preparation of estimates and execution of work.
- 1.10. Establishment of **Road Repairs and Maintenance Cell** for better implementation and monitoring of the ducting and reinstatement activities.
- 1.11. Implementation of **Standard Checklists** to confirm completion of all related activities before release of any payment to contractors.
- 1.12. Identification and demarcation road repair **waste material disposal locations** in each ward.
- 1.13. Preparation and immediate **implementation of a Training Manual** and continuous rigorous training programs for PMC staff at all levels, Contractors, Consultants and other stakeholders is a must. Sporadic training arranged once in a while here and there is of no use.
- 1.14. Formulation of **Training Policy** with an objective to obtain ISO accreditation for smaller units on pilot basis initially and to be extended gradually to the entire Roads Department.
- 1.15. **Morale boosting activities** for Staff at all levels need to be undertaken on a continuous basis. Recognition of good work done, schemes like “Raste Dattak Yojana”, Best Road of the Year Award, Best Employee of the Year Award, transparent and dispassionate systems to select Awardees, increments for acquiring additional qualifications, encouragement to be a member of technical forums like IRC, PIARC, for writing technical papers etc. need to be in place.

- 1.16. Monthly review for implementation** of recommendations of the RDRM Committee and STAC Committee report of PMC under chairmanship of Additional Municipal Commissioner, Special.
- 1.17.** Monthly review of the work of the Roads Department by the Municipal Commissioner personally on the basis of management by default. Half an hour monthly spent by the Municipal Commissioner would go a long way in improving the condition of roads in the city. An interaction with STAC on regular basis would help MC to get a third party view of reforms process.

PREAMBLE

2. Pune city was known to be a pensioner's city historically. In early sixties of the last century, it started converting into an industrial hub with development of heavy industries on the outskirts of the city in PImpri-Chinchwad area. It concurrently developed itself into an education center. Today, a large number of national and international students come to Pune for pursuing their higher education in various fields. With the advent of Information Technology, city also developed as a hub for knowledge industry. All these developments brought unprecedented influx of people in the city. This created heavy strain on the infrastructure. Roads in particular are the worst sufferers, as their development could not keep pace with the time. Therefore, Pune Municipal Corporation needs to appreciate that unless it gives adequate attention to the serviceability of the roads, it cannot be said that it is fulfilling its responsibilities with proper care and due diligence.

3. The problems of Pune roads in general are summarized as under-
 - 3.1. Capacity constraints
 - 3.2. Mixed traffic
 - 3.3. Encroachments
 - 3.4. Inadequate public transport
 - 3.5. Vehicular growth without any limitation
 - 3.6. Shortfall of funds

4. These are the concerns, which are beyond the control of the Roads Department of PMC. Unless Pune Municipal Corporation decides to address these concerns with due seriousness and takes appropriate measures to find remedial solutions substantial improvement in the quality of service to a common citizen cannot be achieved.

5. It can be mentioned here that provision of number of number of flyovers cannot be a solution to the problem of traffic management. Construction of flyovers only would shift the spot of congestion from one point to another.

In fact, construction of flyovers should be considered as a last resort to resolve the issue of congestion at any traffic junction.

6. As far as the remedial measures within the reach of the Roads Department are concerned, these are summarized below. Committee has dealt with these parameters in depth elsewhere in its Report-
 - 6.1. Alertness and Immediate Action on Problems.
 - 6.2. Measures to ensure non-recurrence of problem.
 - 6.3. Intermediate action.
 - 6.4. Long-term solution.

7. As a result of a PIL, at the instance of High Court of Bombay, a Standing Technical Advisory Committee was established way back in year 2006. Though in the initial years the work of the Committee did not progress satisfactorily, partly again due to apathy towards the affairs of the Committee by the PMC; Committee finalized and submitted its detailed report on Roads in September 2013. This report has identified around 130 action points. However, action to implement this report in letter and spirit is totally missing. With the result that, no improvement in the last three years is seen in the level of service that is being provided by the Pune Municipal Corporation.

8. The Standing Technical Advisory Committee had suggested that it would prepare a similar report for Bridges and cross drainage works. But no initiative has been taken till now to entrust this work to the STAC.

9. Now, Pune Municipal Corporation has formulated one more committee viz. this RDRMC to address the same issues, which form part of TOR of the STAC.

10. Pune Municipal Corporation needs to realize that unless it takes concrete action to implement reports of such Committees, no purpose would be served by formulating such committees again and again.

CONSTITUTION OF THE COMMITTEE

11. The following members were included in the RDRM Committee
 - Shri Ajit Pawar, Former Secretary, Maharashtra PWD- Chairman.

 - Shri Sudhir Janjot, Chairman, CIC- Member

 - Shri Pramod Bongirvar, Former Secretary MSRDC – Member.

 - Shri Vivek Velankar, Sajag Nagrik Manch – Member.

 - Shri Prashant Inamdar, Pedestrians First – Member.

 - Shri Vikas Thakar, Technical Consultant- Member.

 - Shri Dnyaneshwar Molak, Jt Commissioner, PMC – Member.

 - Shri Rajendra Raut, Chief Engineer (Roads) – Member.

 - Shri Shramik Shevate, PMC – Secretary.

TERMS OF REFERENCE OF THE COMMITTEE

- 12.** The terms of reference of the RDRMC are as follows.
 - 12.1.** Technical norms to be followed for development of Concrete / Bitumen/ UTWT roads.
 - 12.2.** Study the shortcomings of the present practices followed by PMC to carry out Road Development and Repair works and to create guidelines based on Civil Engineering norms.
 - 12.3.** To formulate guidelines for formulation of information system for public regarding Road Development and Repair works.
 - 12.4.** To formulate guidelines for formulation of Safety Norms for Citizens during Road Development and Repair works.
 - 12.5.** To formulate guidelines for formulation of a Central Coordination Cell so as to ensure better coordination amongst various agencies and Stakeholders.
 - 12.6.** To formulate guidelines for formulation of a separate Road Maintenance and Repair Cell.
 - 12.7.** To formulate guidelines for formulation of a Vigilance squad for Quality control.
 - 12.8.** To formulate guidelines so as to bring about harmony and proper Coordination between inter-departments of PMC and create checklist for work done.
 - 12.9.** To suggest and guide in the Use of new technologies for Road Development and Repair works.
 - 12.10.** To formulate guidelines for disposal and reuse of debris and excess waste generated during Road Development and Repair works.
 - 12.11.** To formulate guidelines to carry out quality work during construction and or repairs of Storm-water and Drainage Chambers, Speed-breakers, etc.
 - 12.12.** To formulate guidelines so as to arrange Training programs and preparation of a training calendar which should be given to PMC Engineers, Contractors and employees.

MEETINGS OF THE COMMITTEE

13. The Committee proceedings were conducted between April 2016 – July 2016 during which 08 (eight) meetings were conducted by the Committee to deliberate on the various issues pertaining to road repairs and maintenance.
14. It was proposed to submit the report of the Committee by 30/04/2016. However, the Committee opined that the time limit was inadequate and it was not possible to finalize the report in such a short period. The drafting of report required intensive interaction with various stakeholders related to the road infrastructure. Hence, considering the impending monsoon works and likely emergency situation for completion of pre-monsoon activities an ***Interim Report (Annexure-1)*** was submitted by the Committee dated 29/04/2016 indicating the immediate measures required to be taken before the monsoon to maintain the road in proper serviceable condition during monsoon.
15. The mandate for submission of the final report of the RDRMC was subsequently extended to 31/07/2016.
16. In year 2006, a Public Interest Litigation No 111 of 2006 was filed by a NGO against Pune Municipal Corporation for the poor condition of the roads in the city. In accordance with the directives of the Hon. High Court, the Standing Technical Advisory Committee was constituted by PMC vide Municipal Commissioner's Office Order No 67 dated 7/05/2007 comprising of road experts from various sections like Govt. organizations, educational and research institutes and private sector. The STAC submitted a comprehensive report addressing each aspect (chapter wise) of the road development, maintenance and repairs. The report provided specific recommendations for technical and administrative overhaul of the working system of Road Department, PMC. The current committee observed serious lack of implementation of the detailed recommendations made by the STAC. Many recommendations of the STAC were presented to the Committee as being implemented. However, the committee feels that any

particular recommendation cannot be termed as “implemented” unless it is completely imbibed into the PMC working culture and there is absolutely no chance of reverting to the old practices and shortfalls. This has seldom been observed in the case of the STAC recommendations and most recommendations seem to be superficially implemented in most instances. Moreover, other departments of PMC or the Ward Offices have not grasped the seriousness of the STAC recommendations.

- 17.** Unfortunately, there has been no serious effort at the top Management level to review and track the implementation of the STAC report, which has resulted in recurrence of the same problems over the years without any permanent solution.
- 18.** It is also observed by the Committee that even though the technical recommendations of STAC seem to have been adopted to some extent by the Road Department of PMC, most of the recommendations relating to the administrative and systemic changes/up gradation have been systematically overlooked.
- 19.** The Committee also feels that that as this is not the first committee formed by the PMC to review the working of the road department and suggest remedial measures, the core issue rests with thorough implementation of expert recommendations and monitoring rather than non-availability of standard guidelines or technical knowhow.
- 20.** The Committee opines that there needs to be a shift in the approach of the top management and acceptance of the fact that there is a basic requirement for systemic overhaul rather than quick fix solutions and adopting firefighting approach. Unfortunately, the Road Department appears to be in the mindset that it is doing whatever best is possible and there is no further scope for improvement. Unless the Department comes out of this mindset and brings itself in learning mode, no improvement can be possible.

- 21.** A meeting with inter department stake holders was conducted on 01/06/2016. The meeting was attended by Joint Commissioners of 4 PMC Zones along with the Deputy Municipal Commissioners and Ward officers of the PMC. The shortcomings of the present day-to-day maintenance and repair activities were discussed and some important feedback was provided by the PMC Officials. The points discussed and suggestions that were revived during the meeting and thereafter are attached in **Annexure 2.**
- 22.** The meeting with various external utility service providers was also held to understand their problems and suggestions. The common points that emerged during the meetings are attached in **Annexure 3.**
- 23.** The Committee felt that an intensive interaction with the PMC staff at all levels, Contractors, Consultant representative and Third Party Audit representatives was also important to understand the reasons for not achieving the desired results. However, such a meeting could not be held and the inputs from these stakeholders were not received.
- 24.** Even though the Committee submitted an interim report in April 2016 to address the pre-monsoon works, the roads in Pune city suffered significant damage and potholes were observed on many roads during the monsoon of 2016. These reports were published in the print media and also were highlighted in visual media. This further reinforces the fact that the implementation of recommendations/guidelines remains poor and is not taken up with due diligence by the Municipal Corporation machinery.

IMPLEMENTATION ISSUES

- 25.** The following implementation issues were highlighted during various meetings and discussions with stakeholders of PMC Roads.
- 25.1.** Lack of clear guidelines as to where concretization or bituminous works should be taken up, resulting in pressure from Corporators for their own choice of work.
 - 25.2.** Priority of water supply, sewer, electrical departments of PMC, MSEDCL, MNGE and road department/ ward office are not same and hence the work of utilities is not coincided with road repair or development work.
 - 25.3.** Level of the roads is not fixed as per design/drawings especially for smaller works where Third Party Inspection Agency (TPIA) is appointed.
 - 25.4.** The TPIA only looks after the material testing and is not addressing other issues related to line, level, measurements, workmanship etc. PMC engineer does not have resources to undertake this task.
 - 25.5.** There is no clear demarcation of road ownership and hence multiple agencies are undertaking similar work and responsibility of repair/maintenance cannot be fixed.
 - 25.6.** Maintenance repair of trenches is not carried out by single agency and therefore there is no accountability. Thus the work is mostly shoddy and of poor quality and it gets damaged during monsoon.
 - 25.7.** There is no single source of inventory data for basic road information or maintenance and repair information of roads in Pune.
 - 25.8.** PMC technical staff, especially engineers, are severely burdened and find it difficult to even attend training courses etc. New engineers who are posted to Road Department are not aware of the developments and new technology that is being used in Road Department.
 - 25.9.** Permission to utility service providers is given at Main Department level and the ward office is unaware of the permissions resulting in delay for repair of trenches.

- 25.10.** There is complete lack of support from public or police for carrying out any maintenance or repair work during the daytime resulting in poor and shoddy work.
- 25.11.** There is no demarcated location for storage/disposal of waste debris from the road repair/maintenance work in the city.
- 25.12.** There is no information regarding the locations of storm water and sewer lines, diameters, chambers and their maintenance history, which creates problems for immediate repairs.
- 25.13.** Norms for speed breakers and speed table are not available. Various agencies carry out work of speed breakers/speed tables and there is no uniformity.
- 25.14.** Budget constraints do not allow 100 % cleaning of all the chambers prior to monsoon as the numbers are increasing each year.
- 25.15.** Budget of reinstatement and length of trenching is not commensurate.
- 25.16.** There is lack of adequate supervisory staff with main department as well as ward offices. PMC Engineers and supervisory staff is not well conversant with road construction techniques and machinery, supervision norms, quality control etc.
- 25.17.** Staff of the contractors is also untrained and unaware of basic construction and quality control norms.
- 25.18.** Many a times consultant staff is of junior nature and inexperienced and fails to enforce the supervision, workmanship and quality requirements.
- 25.19.** Work of Third Party Audit agencies is highly unsatisfactory at the Ward office level. Many new agencies with inexperienced staff are undertaking Third Party Audit works resulting in poor work quality, workmanship and failures. There is no system for empanelment of Third Party Audit agencies. Single agency has multiple works and does not provide proper justice to the work. TPIA is also not taking care of workmanship and measurements for work.

- 25.20.** Contractors and utility service providers fail to provide the adequate safety precautions for the reinstatement and repair works. There is lack of deterrent for not providing safety measures.
- 25.21.** Lack of central coordination cell results in problems for coordination with various departments.
- 25.22.** Road maintenance and repair responsibility cannot be fixed on any single agency resulting in poor repair work on each occasion.
- 25.23.** Existing utilities make it very difficult to house the new utilities like sewer, gas line, OFC cables and have to be installed many a times under carriageway.
- 25.24.** Provisions made by PMC even for new roads are inadequate to house some of the utilities like gas lines etc.
- 25.25.** Utility service providers are not very forthcoming with new technology like trenchless technology for utility work.

COMMITTEE RECOMMENDATIONS

26. Based on the above deliberation, the following recommendations are made by this committee.

26.1. Development of Concrete / Bitumen/ TWT roads.

TECHNICAL PARAMETERS

27. For major strengthening works e.g. concretization, a policy decision by PMC has to be taken. For e. g. all roads less than 12 m to be covered with TWT in phases.
28. All major roads above 12m should be concretized in a phased manner considering the maintenance aspect involved in bituminous roads.
29. There is need to review the width of surface which is bituminous/ black topped or concretized to facilitate laying of future services. For roads up to 6.0 m the width of utility corridor may be 0.75 m and for 6 to 12m wide roads, it could be 1.00 m. Above 12 m road width, minimum 1.25 m utility corridor should be maintained.
30. Concretization of internal lanes of width 12 m and below should not be undertaken by conventional concretization method i.e. excavation of existing bituminous road.
31. For existing internal roads below 12 m width, only Thin White Topping (TWT) treatment should be undertaken which does not involve complete excavation of existing road crust.
32. Roads below 12 m width may be considered for Thin White Topping (TWT) provided the following criteria are satisfied.
- 32.1. The blacktopping treatment/ maintenance of the road has been completed at least 3 years ago.

- 32.2. Road is not proposed to be excavated for any utility service line water supply, sewer, electrical cables, OFC, gas line etc within the next 5 years' period.
- 32.3. The above criteria should be certified by the concerned Executive Engineer for that work.
- 32.4. Storm water management of all the properties along the road proposed for TWT should be undertaken as part of the road project and certified by the concerned Deputy Engineer for that Road and he should be responsible for the execution of this work.
- 32.5. Concretization of roads above 12 m should be undertaken only after thorough investigation of existing road, subgrade soil, traffic loading, storm water drainage condition and preparation of detailed project report.
- 32.6. For existing roads above 12 m width, the TWT treatment or concrete overlay treatment should be used based on the design requirement as per IRC SP 76 2015.
- 32.7. Conventional concretization (complete excavation and full crust development) of any existing road should be carried out only in exceptional cases where level of the proposed road should hamper the storm water management of the area or in case the existing road crust is completely failed, only after visit and approval of Superintending Engineer, Roads.
- 32.8. For development of new roads below 12 m, bituminous / conventional concrete treatment may be considered based on detailed soil investigation, traffic data and design requirements.
- 32.9. For development of new roads above 12 m, conventional concrete road treatment may be adopted based on detailed investigation and design.

ADDITIONAL FACTORS TO BE CONSIDERED

33. Based on experience so far and issues noted in Pune, it is necessary that not only lifecycle cost, reduction in maintenance effort etc. but other relevant factors also need to be given due consideration while taking

decision about whether an existing or new road should be made of bitumen or concrete. Some such factors are given below.

- 33.1.** Availability of sufficient space at roadside for providing paved strip /ducts for below ground utilities (for example water, drainage, electricity, communication, gas lines etc.) without affecting footpath.
- 33.2.** Feasibility of shifting all the below ground utilities to roadside in paved area. All the underground utilities may not get shifted to roadside or relocated in cross ducts due to practical constraints and hence may remain below the concrete road. This will necessitate the breaking of concrete road for repairs and maintenance. In case exact location of the utility is not known, breaking may have to be done at multiple locations or in a larger area. This will take more time to attend problem which could become a serious matter in case of emergency situation, for example gas leakage.
- 33.3.** Impact on ambient temperature in the area.
- 33.4.** Impact on sound levels in the area. Vehicle movement on concrete roads results in higher sound levels as compared to tar road.
- 33.5.** Impact of increase in height of road surface in case of overlay on existing tar road. Some critical factors to be considered are
- 33.6.** Whether efficient storm water drainage is possible without severe runoff / accumulation causing flood like situation on road or water overflowing in road side properties
- 33.7.** Whether roads meeting the road to be concretized would be at lower levels resulting in storm water gushing down these roads causing unsafe conditions
- 33.8.** Whether the level difference between roads would be substantial resulting in steep slopes and unsafe conditions for vehicle movement
- 33.9.** Whether electric power supply (cables, power distribution boxes etc.) would be affected because of the level difference
- 33.10.** Whether the level difference would cause problems for access to road side properties
- 33.11.** Whether the level difference would affect movement of emergency vehicles as well as rescue.

- 33.12.** Impact on existing trees at roadside. Concrete pavements constructed without taking into account the provisions for trees weaken / damage tree roots, cut off their water supply and may also result in uprooting of trees in the event of rains or storms. Apart from loss of precious trees, this also leads to danger to life and property.
- 33.13.** Impact on new tree plantation - whether sufficient space available and provided at the road side for plantation of trees as per Tree Act.
- 33.14.** Impact on water percolation. There will be reduction water percolation due to lack of soil surface leading to depletion of subsoil water table. Water runoff without absorption in soil leads to increased water accumulation on road and consequent problems. Lack of water percolation will also affect health of trees leading to ultimate death of trees.
- 33.15.** Safety aspects for provision of road marking and pedestrian crossings should be considered.
- 33.16.** Whether provision for future projects on the road is made (for example 24 hour water supply)
- 33.17.** Consultations with citizens in the area where concrete road is proposed and taking into account all the concerns expressed by the citizens who are directly affected by adequately addressing the issues raised by them.
- 34.** Cost benefit analysis should be done in every case for concrete overlay or new concrete road vis-a-vis bitumen road. Costs for following should be added to arrive at the actual total cost of concrete road.
- 34.1.** Cost of preparatory work of testing, milling etc.
- 34.2.** Cost of paving of areas which cannot be concretized
- 34.3.** Cost of shifting of utilities to road side or in ducts
- 34.4.** Cost of repairs to utilities damaged during shifting
- 34.5.** Cost of reinstatement of footpaths
- 34.6.** Cost of reinstatement of road furniture, signage etc.
- 34.7.** Recurring cost of maintenance / replacement of paving blocks
- 34.8.** Cost of maintenance of concrete roads - filling up of cracks, holes, sealant filling in gaps between slabs, surface repairs etc.

- 34.9.** Cost of maintenance of utilities buried under the concrete road (including breaking and reinstatement of concrete if required)
- 34.10.** Other direct, indirect and consequential costs (including those at sr. nos. 1 to 7 above)

ROAD DEVELOPMENT, MAINTENANCE AND REPAIR WORKS

- 35.** All roads below 12m ROW including footpath should be executed by Ward office.
- 36.** Ward office should execute road junction work only if all roads meeting at the junction are below 12m ROW.
- 37.** Road Department should execute all roads of 12m ROW and above including footpath, cycle tracks irrespective of cost of the project.
- 38.** Road department should execute road junction work where one or more roads meeting at the junction are of 12m ROW or above. Traffic department of PMC should be involved only in the design of the junction and not in execution.
- 39.** Maintenance of roads below 12m ROW including footpath, road furniture, road markings/ zebra marking etc. should be done by Ward office.
- 40.** Ward office should do minor maintenance of roads of 12m ROW and below including footpaths, cycle tracks etc.
- 41.** Major maintenance of roads of 12m ROW and above including footpath, cycle tracks, road furniture, road markings / zebra marking etc. should be done by Road department.
- 42.** Road department should be responsible to take decisions regarding provision of speed breaker humps on all roads.

- 43.** Speed breaker bumps on roads below 12m ROW should be installed by Ward office.
- 44.** Reinstatement of roads to original state (trench filling, chambers etc.) should be done by competent agency appointed for the purpose and not included in the scope of contractor undertaking the main job (for example - laying of pipelines, maintenance of utilities etc.)
- 45.** Financial Aspects of Repairs and maintenance
 - 45.1.** Cost estimate should be based on exact technical requirements and any other special considerations for the work. Only the DSR should not be followed without application of mind.
 - 45.2.** Cost for all required / specified safety measures and work zone management during work execution should be included in the estimate and made a paid item in contract.
 - 45.3.** Cost estimate for a particular road should be applicable only for that road and change of location should not be allowed. Fresh estimate should be prepared in case of change in location.
 - 45.4.** Cost estimate for reinstatement of road (trench filling etc.) should be adequate to cover the restoration of road to original safe and usable state as per specified norms.
 - 45.5.** Reinstatement charges collected from external agencies (MSEDCL, BSNL, MNGL and private service providers) should be credited to a separate account and allotted to Road department and ward offices for reinstatement work only. These funds should not be used/diverted for any other purpose.
 - 45.6.** Adequate separate budgetary provision for road maintenance should be done in the annual budget and required funds as per the quantum of roads / volume of work should be made available to Road department and each Ward office for timely maintenance of roads including regular periodic repainting of markings for zebra crossings, speed breakers etc.

- 45.7.** Proper planning and sequence of work execution must be finalized and approved by Executive Engineer to cause minimum hardship to local residents. 100 % payment should be payable to Contractor only after following the planning and sequence as approved by EE, PMC. Deterrent in the form of penal action for delay in execution of approved work sequence and timeline should be incorporated in the standard bidding document of PMC
- 46.** A standard check list should be evolved to list out common deficiencies noticed by public and contractor's payment should not be released unless these deficiencies are rectified. This checklist should form part of the tender document. This also means review of construction specifications regarding the following aspects but not limited to:
- 46.1.** Adjoining area around manhole attended properly.
 - 46.2.** Improper levels of road and manhole.
 - 46.3.** TWT raised level resulting into flooding of adjoining houses.
 - 46.4.** Reverse slope in property approaches be given.
 - 46.5.** All the debris not removed and site not cleaned.
 - 46.6.** A punch list of deficiencies should be prepared and 10 % amount from the bill should be withheld until rectification is done.
- 47.** Punch list / Checklist should be certified by Junior Engineer with each RA bill of contractor without which, the bill should not be processed. It should be responsibility of the Junior Engineer to ensure the compliance of all points covered under the checklist 50 % verification of all checklists should be carried out by Deputy Engineer and 10% verification should be carried out by Executive Engineer before passing of contractor Bill.
- 48.** The replacement of existing footpath paver blocks should not be allowed before 5 years of completion of the earlier work and should be certified by the Executive Engineer. Complete record of disposal of old paver blocks should be attached along with the bill for new replaced paver blocks and certified by the concerned Engineer.

- 49.** Policy guideline should be prepared for Third Party Auditor and Project Management Consultant works. Third Party Audit works or Project Management Consultancy work should be allocated to experienced and reputed firms only with adequate technical manpower and experience of similar works with other Government Departments.
- 50.** Minimum experience of 10 years in Third Party Audit Works / Project Planning, Design and Supervision Consultants should be considered minimum basic prerequisite for allocation of any such work of PMC. These guidelines should be strictly followed for all works of PMC.
- 51.** A quality based system for monitoring performance of contractors and consultants should be developed. A database should be prepared within PMC and records should be maintained covering the following aspects with marking scheme for Contractors each project. The marking should be certified by the Concerned Executive Engineer of PMC.
- 51.1.** Timely Completion – 20 % marks
 - 51.2.** Quality and Workmanship – 30 % marks
 - 51.3.** Deployment of quality technical staff & Engineers – 25 % marks
 - 51.4.** Safety precautions during construction – 25 % marks
 - 51.5.** Average score of last 03 (three) completed works of Contractor with PMC should be considered as Post Qualification criteria for new work. Minimum 70 % score should be mandatory to qualify for new work of PMC. Contractors failing to achieve the required score should not be allowed to bid for future works of PMC until improvement of performance score.
- 52.** Similar system should be developed for Consultants/ Third Party Auditors to qualify for new works covering the following aspects
- 52.1.1.** Timely Completion – 20 % marks
 - 52.1.2.** Accuracy of Design, Drawings and estimates – 20% marks
 - 52.1.3.** Quality and Workmanship – 20 % marks

- 52.1.4.** Deployment of quality technical staff & Engineers – 20% marks
- 52.1.5.** Safety during construction – 20 % marks
- 53.** Average score of last 3 completed works of Consultant with PMC should be considered as Post Qualification criteria for new work. Minimum 70 % score should be mandatory to qualify for new work of PMC. Consultants/ TPIA failing to achieve the required score should not be allowed to bid for future works of PMC until improvement of performance score.
- 54.** The external testing of construction material should be carried out in reputed and Accredited (NABL) laboratories only by the PMC, in presence of a Third Party Auditor representative. Conflict of interest scenario arises when the testing is carried out in laboratories owned/ associated with the Third Party Audit agency and such situations should be strictly avoided.
- 55.** The Sampling and testing of each representative sample should be conducted in presence of the Third Party Audit Engineer for project works and certified by the Third Party Audit agency. Random checking and testing of 10 % samples should be done in presence of the PMC Junior Engineer.
- 56.** It was brought to the notice of the Committee that wherever external Project Management Consultants and Third party auditor services are deployed, the concerned PMC staff feels that it has no responsibility towards monitoring the progress and quality of work or taking efforts towards removing the obstacles in the smooth implementation of the project. To overcome this deficiency, it is recommended that a standing committee consisting of representative of PMC, Third Party Auditor other stake holders and headed by the concerned Executive Engineer in charge of the project should be held responsible for the progress and quality of the project.

- 57.** It is also felt that the Officers of the PMC do not feel themselves responsible for delay in the project implementation or for the deteriorated quality of the work. To remedy this situation, it is suggested that an Annexure should be incorporated forming part of the Confidential Report of the concerned Officer which would provide information relating to quality and timely completion of the project for which the concerned officer was in charge.
- 58.** Surprise checks should be carried out by the Vigilance Squad of PMC for assessing the work of the Project Management Consultants and Third Party Audit agencies. Strict action against the concerned agency should be proposed in case of non-compliance to specifications and standards.

INFORMATION SYSTEM FOR ADDRESSING PUBLIC CONCERNS

- 59.** Complaint/grievance redressal system of PMC should be more sensitive towards public complaints. Many a times the responsibility of work (especially reinstatement, footpath or road repair) is passed onto the other department and the work is never completed to satisfaction of the complainant. This practice should be discontinued and the resolution of complaint should be done through as single agency of PMC without passing on the same to another Department.
- 60.** Complaints received from citizens / published in the media should be categorized under following heads
- 60.1.** Safety related (which generate accident prone situations with danger to life or possibility of injuries to road users including pedestrians)
 - 60.2.** Traffic related (affecting smooth movement of vehicles)
 - 60.3.** Health and hygiene related
 - 60.4.** Inconvenience related
 - 60.5.** Improvements related
 - 60.6.** Routine nature
- 61.** Time duration for attending to the complaint should be as per above priority.

- 62.** Weekly report should be prepared and monitored by higher authorities.
- 63.** Public should be allowed to upload 2 to 3 photos of the compliant location with description on PMC website and complaint resolution photos should be added by concerned PMC department after resolving the issue.
- 64.** Whatever reports appear in the media regarding road works should also be addressed likewise and full clarification with appropriate photographs of the remedial measures taken by the PMC should be uploaded on the PMC website within a week's period. The compliance of these requirements should also reflect in the Confidential Report of the concerned official.
- 65.** Before undertaking any project work or maintenance work (barring routine maintenance) public should be kept informed about the projects that are going to be undertaken in near future. This should be done by displaying the intention to undertake such works on the PMC website as soon as the decision to undertake such work is taken up. Comments, suggestions etc. should be invited from the public concerning such works.
- 66.** Before floating tender for the work, a meeting of all stakeholders should be arranged in the concerned Ward office by giving publicity of such meeting on the PMC website.
- 67.** Such meetings should be attended by at least the Superintending Engineer concerned and minutes of such meeting should be drawn and hosted on the website for a limited period of say about a month.
- 68.** Taking into account this feedback the Corporation should incorporate changes it considers necessary in the project and thereafter, action to put the work to tender should be taken up.

SAFETY NORMS DURING MAINTENANCE AND REPAIR WORKS

- 69.** The problem of inadequate safety provisions by contractor should be addressed by making separate provision in estimate and tender for each roadwork.
- 70.** Penal action up to 10 % of bill amount should be deducted for non-compliance to the safety standards as specified in the tender document.

CENTRAL COORDINATION CELL

- 71.** A central coordination cell should be established within the PMC with immediate effect. The Cell should take note of defects/deficiencies noticed by citizens. These complaints should be forwarded to respective Junior Engineer or Ward office. A proper periodic review of these complains should be done by Officer of rank Executive Engineer.
- 72.** A GIS Based map operated and updated by Central Coordination Cell of PMC should be implemented immediately to include all works of PMC (Roads, Water Supply, Sewer, Storm Water, Bridges, Flyovers, Electrical, Utility Permissions etc). The technical approval to any PMC work should be given only after report from the Central Coordination Cell of PMC.
- 73.** The payment to contractor for any work of PMC should be issued only after report from Central cell regarding the updating of information to repository of the PMC database related to the that work.

ROAD MAINTENANCE AND REPAIR CELL

- 74.** There should be a single Department responsible for reinstatement of any road or footpath work carried out in the city so as to avert the incidences of passing of responsibility to another department by each agency. The formation of such Department should be initiated by the PMC.

75. Present procedure for sanction of work for laying services need review so as to avoid duplication.
76. There is need to perfect technology for CLSM for trench filling activities. Few standard mix design may be got done externally. The criterion could be as follows (i) In 3hrs gain instruct to bear weight of main (ii) In weight hrs. strength of 5kg/sq. centimeter to bear the weight of car and in 48 hrs strength of 15kg/sq. centimeter to bear weight of truck. These criteria may be worked upon and design should be finalized and made part of all reinstatement works.
77. Presently reinstatement is done in two stages a) temporary filling by utility provider and b) permanent work by specialized agency by PMC. Instead, first stage reinstatement should be done by service provider by adopting CLSM technology and final 75 mm bituminous surface by PMC. The reinstatement charges should be accordingly reviewed.
78. All works on roads above 12 m irrespective of cost should be executed by Main Road Department of PMC.
79. IRC-82 2015 provides guidelines for rating of roads and type of treatment needed. This should be applied for roads above 18m width. A study group of few engineers and consultant should be appointed to review this code and make changes noting the local needs. For roads less than 12 m, the expenditure on maintenance done in last five years could be criterion
80. Based on experience of new maintenance contract, appropriate changes in same to be done.

VIGILANCE SQUADS

81. A Vigilance squad of PMC directly reporting to the Additional Municipal Commissioner should be established. The squad should randomly visit and

technically audit the work of PMC Engineer, Contractor, Consultant and Third Party Auditor and send his report to the Additional MC.

- 82.** A monthly review of all projects audited by the Vigilance squad should be taken by the Municipal Commissioner.
- 83.** Random projects of Road Department and Ward Office should also be selected and Technically audited by Vigilance squad for checking the implementation of the STAC Recommendations.

COORDINATION BETWEEN INTER-DEPARTMENTS OF PMC

- 84.** A GIS based reference & location system should be associated with each PMC work so as to prevent duplication of work & redoing the same work within a short time frame of less than 5 years.
- 85.** Any new project work should not be commenced without the verification of the geo referencing of the project site by the concerned Engineer and payment should not be released without the entry of the geo-referenced coordinates of the completed stretch into the system.
- 86.** An Asset management system should be implemented of all the Roads in the Pune city. Budgetary allocation in the yearly budget must be done based on the study of the condition of existing road assets and available maintenance funds with priority been given to urgent repair roads.
- 87.** Preventive maintenance of roads should be considered as a priority item under the work of the Road department.
- 88.** A very good idea of appointing a guardian for each road (Raste Dattak Yogana) was conceived, wherein, it was proposed that one officer of PMC (need not be from the Roads Department) would be assigned the responsibility of looking after the upkeep of a particular stretch of road, say for one year. He shall move on the road frequently while undertaking his

routine work and report to the concerned officer in charge of the road, any anomaly/non-conformity.

89. Based on the idea of “Raste Dattak Yojana”, annual prize to the best maintained road in the year should be implemented by honoring the Guardian of that stretch of road and the Engineer of the Road Department who is responsible for maintenance of that road.

USE OF NEW TECHNOLOGIES

90. To reduce hardship of citizens' specifications of items need to be changed which may cost additional money.eg opening of TWT road in 48 hrs. by adopting high strength concrete etc.
91. Trenchless technology should be encouraged. A list of standard facilities that needs to be given to the contractors should be prepared and approved as a policy. Municipal Commissioner should take periodic review of the policy and make changes noting the suggestions of service providers, PMC staff and agency owning this equipment. Hence forth, only trenchless technology should be insisted as far as possible. Reinstatement charges should be reviewed accordingly.
92. Municipal Corporation must give funds for applied research and innovations in technology.
93. The use of milled road material should be made mandatory for lower Bituminous layer by recycling the hot mix plant.
94. Use of commercially available high strength concrete should be made for repair of existing manhole chambers.
95. A team of officers to be sent to Surat to study CGBM technology and adoption of the same in Pune.

96. SCADA based monitoring of RMC and Batch Plants should be compulsory. The E- billing system as adopted by PWD Pune should be used to cross check the quality and quantity data through SCADA devices fitted to construction machinery, plant and laboratory testing equipment.
97. Lump sum provision to be made in budget for the trial stretches and implementation of new technologies.

DISPOSAL AND REUSE OF DEBRIS AND EXCESS WASTE

98. Site for dumping surplus material during road works should be identified by PMC in each Ward/ Zone Office area.
99. All surplus dug up material should be carted away to permitted places and no material should lay around the trenches for more than 24 hours and in case of failure it should be carted away by Road Department at the cost of agencies concerned with 100% penal charges. The location for dumping of excess material should be informed by PMC to the agencies in the work order itself.

CONSTRUCTION AND REPAIRS OF STORM-WATER AND DRAINAGE CHAMBERS, SPEED-BREAKERS

100. The construction of masonry storm water and utility chambers in carriageway should be completely stopped. RCC or precast chambers should be used.
101. Use of precast RCC manholes (Storm Water/ Sewer) available in the market should be made mandatory for new road projects and at locations of severely damaged manhole chamber locations.
102. Use of Precast manholes for utility service chambers should be made mandatory.

- 103.** Wherever precast RCC manholes are not possible at least RCC manholes should be used. The practice of using the masonry manholes especially in the carriageway portions should be discouraged/ stopped.
- 104.** Standard guidelines on trench filling with GSB, PCC issued by PMC should be implemented by all departments.

TRAINING PROGRAMS

- 105.** Human resource is a major input in ensuring proper quality of the output i.e. citizen friendly roads. With this in view it is absolutely necessary to impart continuous training to all the stakeholders who are responsible for providing good roads. This training needs to be exhaustive and should include all types of training besides technical training. An exhaustive Training Manual needs to be prepared which would identify the training needs of each and every individual who is part of the road building team and would provide guidance as to who needs to be trained, what type of training does he need, who can provide this training, where the training needs to be provided and when it should be provided. For each employee of the Corporation, a specific number of training days per year need to be finalized.
- 106.** This should also include the training to the Contractor, Consultant and personnel of Third Party Auditors etc.
- 107.** As regards the technical training, there should be compulsory minimum 4 to 5 Days Certified Technical Training program & Site visits (to locations of modern machinery/ equipment) for each PMC Engineer, Consultant Engineer, Contractor Engineer conducted by reputed Technical Training Institutes annually. The deployment of PMC, Contractor or Consultant Engineer should be allowed only if he has attended the said program within last 12 (Twelve) months. This technical program should cover the following aspects related to work (Both Concrete Roads and Bituminous Roads/ Culverts & Bridges)

- 107.1.** Basics of Design
 - 107.2.** Material Specifications and Standards
 - 107.3.** Preparation of Estimates, BOQ and Rate Analysis, Construction Drawings
 - 107.4.** Site supervision, workmanship issues
 - 107.5.** Site record keeping, measurement recording, Bill preparation and Scrutiny
 - 107.6.** Quality Control & QAP
 - 107.7.** Maintenance aspects
 - 107.8.** Modern techniques in construction, machinery and material.
- 108.** Such Technical program should be specially designed by PMC through an expert agency with inputs from PMC, PWD retired Engineers, Consultants and Contractors for finalization of content of the coursework. Similar training program should be devised for Plant and Machinery Operators and Supervisors of Contractor.
- 109.** The valid certificates of such trained personnel should be part and parcel of the Contractor and Consultant Registration Certificate with PMC. No new personnel of Contractor / Consultant should be allowed without attending such certified technical training programs.
- 110.** Periodic assessment of all Engineers of the Road department should be conducted. This should be done every 06 months in the form of objective test. The markings should indicate the effectiveness of the training programs conducted and it will also help in identification of areas where skills need to be imparted to the Engineers.
- 111.** A concise summary of the STAC recommendations should be prepared in simple language and workshops should be held after every 3 to 4 months for PMC Engineers, Consultants, Contractor etc covering each aspect covered under the STAC recommendations

- 112.** The following administrative reforms required for improvement of working of the Road Department should be taken up with immediate effect.
- 112.1.** Establishment of Central Planning Cell of PMC.
- 112.2.** Formation of separate Storm Water Cell of PMC.
- 112.3.** Finalization of Work Load norms and staff augmentation
- 112.4.** Implementation of Training Manual and systematic training program.
- 112.5.** Package size of project works should be between 3 crore to 10 Crore to to ensure that modern machinery could be deployed on the works with proper quality assurance.
- 112.6.** FIDIC form of tender document should be adopted by PMC.
- 113.** Monthly review meeting on the implementation of the RDRMC report recommendations, STAC recommendations under the Chair of Addl. Municipal Commissioner should be held.
- 114.** The RDRMC has suggested various monitoring mechanisms with a view to ensure delivery of citizen friendly roads such as central monitoring cell, planning cell, coordination cell, public grievance redressal cell, vigilance squads etc. These entities need to report directly to the Municipal Commissioner. The Municipal Commissioner need to take monthly review meetings with these entities where the head of Roads Department would also be present. Such monitoring at Municipal Commissioner level can only increase the effectiveness of these entities. We realize that this would entail upon Municipal Commissioner's time of about half an hour every month. But this would be a time well spent in the interest of the Municipal Corporation. Because, our Indian mindset is to work only for the pleasure of the top management.

HRD RELATED ACTIVITIES.

- 115.** We observe that a mindset of looking at things in a very casual manner has developed amongst the top and middle management of the Roads Department. We do not blame them for this mindset. This is probably because they have developed a feeling that whatever they do, they cannot fulfill the expectations of public, press, media etc. Though it is difficult, they

need to shade this attitude. They need to be conscious of their position as leader of the department and need to act role model for the staff under them.

116. This is possible if activities such as the following are encouraged-

116.1. Quality Circles

116.2. Study Circles

116.3. Encouraging staff to acquire higher qualifications, not only in technical field but also in diverse fields. Organization does need in-house techno-managerial, techno-legal, techno-accounts related experts.

116.4. PMC Road department should develop a library for use of all stakeholders like PMC-staff, Contractor's staff, consultants, staff etc.

116.5. PMC road department should acquire memberships of technical and other bodies. Encourage staff to attend technical sessions, contribute papers etc.

116.6. Organization should try to acquire ISO accreditation, for small units to begin with and spreading it to whole department in due course.

116.7. Undertake "Raste Dattak Yojana" and implement it with due seriousness.

116.8. Teach staff to take criticism in a constructive way by considering it as an opportunity to bring about improvement.

117. Thanks

117.1. Committee expresses its thanks to the Municipal Commissioner, the Pune Municipal Corporation as a body and to all others who directly and indirectly helped the Committee to accomplish its task of preparing this Report.