



NAVI MUMBAI MUNICIPAL CORPORATION

MITIGATION PLAN FOR AIR AND NOISE POLLUTION
AND TO FRAME SOP FOR EXCAVATION AND
BLASTING.

1. PREAMBLE: -

Navi Mumbai City is witnessing a growth in construction & real estate projects with increase in number of redevelopment projects also. Large numbers of these projects are creating a challenge in the form of rising Air and Noise Pollution and frequent complaints from the citizens regarding the blasting carried out on construction sites. Deterioration of Ambient Air Quality leads to environmental concerns and will lead to health problems based on the exposure duration and levels of pollutants.

Various short-term and long-term activities are being undertaken for the prevention and control of air and Noise pollution in the city. To strike a balance between controlling pollution levels and strengthening Navi Mumbai's infrastructure, the Navi Mumbai Municipal Corporation (NMMC) has decided to introduce and enforce an immediate action plan for the mitigation and prevention of rising Air and Noise pollution levels in the City and to address the issue of complaints from citizens regarding blasting operations carried out on construction sites within the area of Navi Mumbai Municipal Corporation.

2. COMMITTEE FORMULATION

To tackle the air and noise pollution and to address the issue of complaints from citizens regarding blasting operations carried out on construction sites within the area of Navi Mumbai Municipal Corporation, the **Hon. Municipal Commissioner** constituted a committee on **23/04/2024** to formulate and implement a strategy to tackle air and noise pollution and to frame SOP for blasting carried out on construction site. The committee was constituted under the Chairmanship of Additional commissioner-2, NMMC. Being an expert in the field of explosives, a representative from Petroleum and Explosive Safety Organisation (PESO) was requested to be a committee member by the NMMC vide letter dated 23/04/2024. However, PESO stated that the subject matter was not related to their organisation. Hence none of the officers from PESO participated in various meetings conducted at NMMC. Constitution of the committee was as mentioned below -

Sr. No.	Member	Designation
1.	Additional Commissioner – 2, NMMC	Chairman
2.	Deputy Commissioner of Police	Member
3.	Asst. Director of Town Planning, NMMC	Member
4.	Chief Scientist CSIR-CIMFR, Dhanbad	Member
5.	Representative of Petroleum and Explosive Safety Organisation	Member
6.	Regional Officer, MPCB Mumbai	Member
7.	Dr. Keshav Sangale, HOD – Structural Engg. department, VJTI	Member
8.	Additional City Engineer, NMMC	Member Secretary

The terms of reference of the committee are as under:

1. To find out the reasons for air and noise pollution in the Navi Mumbai Municipal Corporation area with specific reference to the construction activities
2. To find out the reasons for complaints arising due to excavation and blasting activities carried out on construction sites
3. Suggest measures to reduce/ minimize air and noise pollution due to building construction projects.

4. Suggest measures to mitigate the problems due to excavation and blasting on construction sites and address the issues of complaints received with regards to excavation and blasting operations on construction sites.
5. Monitoring mechanism for overseeing the implementation of air and noise pollution mitigation measures including penalizing the offenders.

3. PROPOSED ACTION PLAN:

Navi Mumbai's Air and Noise Pollution Mitigation Plan and SOP for carrying out Excavation and Blasting operations on construction sites will help to improve air quality by identifying immediate practical and result-oriented actions including the long-term strategies that need to be undertaken by concerned departments to reduce the emissions from various pollution sources. Also, it will facilitate in reducing the complaints received due to excavation/blasting operations carried out on building construction sites.

The Action Plan includes –

A. Identification of air and noise Pollution Sources

- i) To understand the important air and noise pollution sources on building construction sites.

B. Source Wise Inventory of important information related to the Pollution Source

- i) To generate the information related to sources
- ii) To effectively mitigate the plan for targeting sources
- iii) Corrective measures that can be undertaken during implementation
- iv) Target setting for further improvement, etc.

C. Categorization of Projects

- i) To enforce guidelines stringently for building construction projects.

D. Source-wise Actions to Mitigate Air and Noise Pollution

- i) To undertake immediate action for the prevention of air and noise pollution
- ii) Details on long-term action that can be undertaken

E. To formulate SOP for Excavation and Blasting operations

- i) Prepare SOP for blasting operations carried out on construction sites to reduce the complaints received from nearby citizens around the building construction sites.

F. Checklist of Actions

- i) To assess the actions that will be undertaken by various departments

G. Source Wise Enforcement Mechanism for Immediate Action Plan

- i) To develop a Task Force for enforcement of an immediate action plan

H. Source Wise Monitoring Mechanism for Immediate Action Plan

- i) To monitor the progress of implementation of the Immediate action plan,

I. Actions for Non-Compliance

- i) To undertake stringent actions on defaulters based on the inspection

J. Review Mechanism

- i) To review the implementation of the progress of implementation of the immediate action plan.

K. Corrective Actions

- i) To undertake the corrective measures on limitations and the implementation of the progress of implementation of immediate action plan based on the periodic review.

4. MAJOR AIR POLLUTION SOURCES IDENTIFIED ON CONSTRUCTION SITES

- i) Dust arising from Construction & Demolition Activity from various construction sites.
- ii) Dust arising from the transportation of the excavated material from construction sites
- iii) Dust arising due to the various activities going on at construction sites

5. MAJOR NOISE POLLUTION SOURCES IDENTIFIED ON CONSTRUCTION SITES

- i) Noise arising due to various construction activities going on construction sites.
- ii) Noise due to blasting operations and pneumatic rock drilling in hard rock

6. BLASTING, EXCAVATION AND PNEUMATIC ROCK DRILLING ON CONSTRUCTION SITES

- i) Tremors due to blast conducted on Construction Sites
- ii) Damage to adjoining structures due to blast vibrations
- iii) Spilling of the excavated material on roads during transportation of Debris.

7. CONTROL OF AIR POLLUTION FROM BUILDING CONSTRUCTION ACTIVITY

Inventory of Building Construction Projects-

The ward-wise template will include information related to ongoing Building Construction Projects-

Number & Location of Building Construction Project having Plot Area	
> 4,000 Sq. Mt. (Large Project)	< 4000 Sq. Mt. (Small Project)

❖ ACTIONS TO MITIGATE AIR POLLUTION –

These guidelines are mandatory to be undertaken by all the ongoing & proposed Building Construction projects.

➤ Guidelines for Building Construction Projects-

The Project proponent / Developer / Contractor shall –

- i. Erect a continuous Dust or Wind Breaking Tin/Metal Sheets existing more than 20 Feet High around the periphery of the entire Construction structure Project Site.

- ii. Use Tarpaulin/Green Cloth/Jute Sheet on scaffolding covering an entire area under the demolition structure.
- iii. Avoid on-site Crushing & Hammering of Demolition Material.
- iv. Continuously sprinkle Water so that the Debris remains in wet condition
- v. Carry out Water Fogging during the Excavation & Loading & Unloading of material.
- vi. Transport the C & D waste generated within the premises/site of work to the designated unloading site strictly as per the NMMC-approved C&D Waste Management Plan.
- vii. Water / sprinkle water over the soil strata from time to time during the excavation.
- viii. Strictly prohibit dumping of Construction Material and Debris on Public Roads, Footpaths, and Pavements & Open Area.
- ix. Store Loose Soil, Sand, Construction Materials and Debris of any kind & Construction & quantity in the demarcated/dedicated area, properly barricaded & fully covered/enclosed/protected with tarpaulin.
- x. Enclose, properly operate and maintain Chutes, Skips & Transfer Point used for dropping/transfer of material to avoid emission and spillage.
- xi. Carry out Grinding, cutting, drilling, sawing, trimming, mixing and batching of concrete in an enclosed area.
- xii. Carry out vehicular movement inside the project premises slowly and on fixed routes which are paved and have a hard top.
- xiii. Thoroughly clean the vehicles after unloading.
- xiv. Fully cover and protect vehicles carrying construction material protected so as to ensure dust from construction material or debris does not become air-borne during transportation.
- xv. obtain Pollution under Control Certificate (PUC) for all the vehicles carrying C&D waste / material.
- xvi. Carry out Brushing, Brooming & Sweeping on a daily basis only after mild water sprinkling.
- xvii. Adequately water sprinkle other unpaved surfaces & areas with loose soil.
- xviii. Use Green Walls, Screens, Other Vegetation Barriers & any other innovative dust-minimizing technologies.
- xix. Comply the DG Set (if installed) with CPCB/MPCB Standards.
- xx. Carry out Third Party Ambient Air Monitoring every fortnightly from NABL / MoEF & CC Laboratory for projects attracting an Environmental Clearance.
- xxi. Prohibit the use of New/ Discarded Wood &/or Wood Products by construction workers, security guards, etc. as cooking fuel or bonfires to prevent open burning.

❖ ACTIONS TO MITIGATE NOISE POLLUTION

The Developer/Project Proponent/ Contractor shall

- i. Choose less noisy equipment like electronic-powered / hydraulically equipment which is quieter than diesel / pneumatic-powered equipment.
- ii. Cover metal tables, metal wheels, and other metal pieces with rubber to reduce noise vibration
- iii. Reduce noise resulting from vibration of beams and plates by ensuring machine rotational speed does not coincide with resonance frequencies of the supporting structure.
- iv. Add noise barriers to block the direct path of sound waves from the source of noise, protecting workers and the community from noise exposure.

❖ **STANDARD OPERATING PROCEDURE FOR CARRYING OUT EXCAVATION AND BLASTING ON CONSTRUCTION SITES:**

➤ **Conditions to be complied with by the project proponent and to be supervised by NMMC**

- i. In any development proposal, if two or more basements are proposed in the plans/ proposal submitted for approval to NMMC in such case it shall be necessary for developer to submit the proposed blasting/ excavation plan and design for the excavation/blasting to be done for the proposed basement work on site.
- ii. In case of excavation/blasting operation for hard rock it shall be necessary for the Project Proponent / Developer / Architect to submit the detailed Procedure / Blasting Plan which is going to be adopted for the said excavation / Blasting in hard rock. It shall be necessary that its technical plan should be prepared by a registered experienced expert in the field of blasting and the said plan should be certified by an expert Structural Engineer and an organization having expertise in the field of blasting like the CSIR-Central Institute of Mining and Fuel Research (CIMFR).
- iii. Safe and suitable technical methods should be used for quarrying hard stone in close proximity (less than 50 m) of residential houses, high-rise buildings and civil structures so that it does not cause any kind of damage to the nearby buildings. For example: - Diamond cutting, plasma rock fracturing, Rock breakers, Terminator, ripper etc should be used as per the situation.
- iv. Safe and suitable technical methods should be used so that it does not create any kind of nuisance to the citizens.
- v. Controlled blasting may be allowed only when the residential houses /high rise building/ civil structures such as Road, Railway Line, HT Line, Bridge, Tunnel, Gas & Water Pipe Line, etc. are located at least 50 m away from the blast location under the supervision of recognized government scientific agency/experienced blasting consultant.
- vi. If rock excavation work is deemed necessary using controlled blasting within 50 meters of residential houses, high-rise buildings, or civil structures from the blast locations, it can be conducted up to some extent depending on site conditions. However, this must be done under the rigorous supervision of either a recognized government scientific agency specializing in controlled blasting operations near urban areas or a private experienced blasting consultant having expertise in this field.
- vii. It shall be mandatory for the developer to submit the blasting day plan to the concerned police station, Environment and Town Planning Department of Navi Mumbai Municipal Corporation, Fire Officer of NMMC, Ward Officer of NMMC, and Officer of Maharashtra Pollution Control Board 3 days in advance along with the plan certified by Central Institute of Mining & Fuel Research (CSIR).
- viii. To take vigilance regarding the said blasting, it will be mandatory to certify that the conditions laid down by the Navi Mumbai Municipal Corporation as a local authority and planning authority have been fulfilled by carrying out a site visit by the Ward officer / Junior Engineer – Encroachment Dept, NMMC. Also, it shall be mandatory to visit the said excavation site at least once every week or as per the requirement by the concerned Ward Officer/Junior Engineer (Encroachment) of the NMMC till the construction is completed up to the plinth level and a report of the same should be submitted to the NMMC Environment and Town Planning Department.

- ix. The Deputy Engineer/Junior Engineer of the Environment Department and Town Planning Department must visit the excavation site once every 15 days or as per the requirement till the construction is completed up to the plinth level.
- x. Ground vibration and Air overpressure/Noise generated due to blasting must be recorded at minimum two locations (the nearest structure and the complaint house, if any) for each blast using calibrated seismographs. These recorded data must adhere to acceptable levels as outlined by the regulatory body through appropriate blast design. The recorded data should be regularly shared/submitted to the ward office and copies of the same to be submitted to the Environment and Town Planning department, NMMC on daily or weekly basis.
- xi. While approving the building permission, the Navi Mumbai Municipal Corporation shall include these terms and conditions in the approval order.
- xii. Blasting should be carried out as per the guidelines and specifications, stipulated from time-to-time by a certified expert organization as per IS CODE 4081-1986 (Reaffirmed 2005).
- xiii. It shall be mandatory to ensure through an expert Structural Engineer that no adjacent building/construction, citizens are harmed during the blasting.
- xiv. After completion of blasting, care should be taken that no work shall be started and no human entry shall take place on the said site within the period specified in IS CODE 4081-1986 (Reaffirmed 2005).
- xv. Disposal and storage of residual explosives after blasting shall be as specified in IS 4081 – 1986 (Reaffirmed 2005).
- xvi. It shall be mandatory for the concerned developer to keep the CCTV system operational at the workplace during the blasting operation. It shall also be mandatory to keep a register and keep all the records updated.
- xvii. Design of the shore pile if any shall be verified/proof- check from reputed institute.
- xviii. Vibrations due to piling operation shall be monitored till the completion of all piling work.
- xix. While applying for Development permission, the project proponent shall submit the details of the adjacent Buildings/Civil structures.

➤ **Conditions to be complied with by the project proponent and to be supervised by POLICE COMMISSIONER'S OFFICE**

- i. It shall be necessary to obtain necessary permissions from various authorities of the Government such as the Police Commissioner's Office, Petroleum & Explosive Safety Organization (PESO) etc, and follow the terms and conditions mentioned in the permission.
- ii. The Blasting operations should be carried out between 11:00 am to 05:00 pm only. Blasting operations should strictly not be conducted on Sundays and on public holidays.

➤ **Conditions to be complied with by the project proponent and to be supervised by Petroleum & Explosive Safety Organization (PESO)**

- i. Explosives and its accessories used for controlled blasting shall be as per IS CODE 4081-1986 (Reaffirmed 2005).
- ii. Storing and transportation of explosives used for Blasting, preparation for Blasting, Drilling rock for Blasting and Blasting Operations must be as per IS CODE 4081-1986 (Reaffirmed 2005).
- iii. Blasting should be done only through a trained licensed blasting man having shot-firer certificate.
- iv. It shall be mandatory for the developer to follow all the instructions given by the Police Department, Petroleum & Explosive Safety Organization (PESO) while issuing permission/no objection certificate.

➤ **Conditions to be complied with by the project proponent and to be supervised by MPCB**

- i. Noise Pollution (Regulation and Control Rules, 2000 under the Environment (protection) Act 1986 must be strictly followed.
- ii. The Air (Prevention and Control of Pollution) Act, 1981 must be strictly followed.

➤ **SAFETY PRECAUTIONS**

Before Blasting	While Blasting	After Blasting
<ul style="list-style-type: none"> • Ensure the shot is loaded correctly, hooked up, and secured before detonating it. • Look at the schedule to see when to set off the explosives. • For security purposes, review the direction of the blast movement and define the blast area. • Specify who should fire the shot and determine the safe shot initiation location. • Review the communication system between themselves and all other blast area security personnel. • Identify what signals to use to announce the following: <ol style="list-style-type: none"> 1. Pre-blast warnings 2. Blast time 3. All clear 4. Blast countdown suspension • The implementation of general emergency plans is crucial in the case of an unexpected accident or incident. • Evaluate methods for responding to misfires. • Ensure that all cautionary signs have been placed and are visible. 	<ul style="list-style-type: none"> • A red flag will mark the blast area for everyone's safety. • Evacuate all personnel 200 meters from the explosive's detonation site. • Blow a shrill whistle before lighting the fuse. • Ensure the blasting operation is carried out safely and efficiently with the help of skilled professionals. • Unless you receive written permission from the engineer, all blasting activities must occur at least 200 meters from any existing structure. • To ensure the safety of all personnel and surrounding structures, each procedure and security measure related to explosives must use drilling before shot firing, loading after shot firing, and disposal according to regional and national regulations. 	<ul style="list-style-type: none"> • Once the air is safe to breathe, it's time for the Blaster-in-Charge to inspect their work. During this inspection, they should assess the following: <ol style="list-style-type: none"> 1. Hazardous rock conditions 2. The presence of undetonated explosives or initiators 3. Hazards associated with abnormal blast conditions • Any misfire or other dangerous circumstances must be rectified or safeguarded. • After the area is free from any risks to pedestrians, traffic, and personnel on-site, the BIC should signal safety, allowing those posted as guards to be relieved. • A dependable lightning detector is essential to keep watch of any possible electric storms.

8. ENFORCEMENT MECHANISM-

- The above guidelines will be immediately circulated to all the Project Proponents/Architect/Land Surveyors.
- The concerned Project Proponent and registered site supervisor shall be responsible for complying with the said guidelines.
- The guidelines will also be circulated for enforcement to other departments and Special Planning Authorities within NMMC jurisdictions such as Maharashtra Industrial Development Corporation (MIDC) and City and Industrial Development Corporation (CIDCO).

9. MONITORING MECHANISM-

- The project proponent shall submit an undertaking to the Town Planning Department, NMMC stating that the project is in compliance with above mentioned condition.

10. ACTIONS FOR NON-COMPLIANCE-

- If the project proponent fails to comply with the conditions mentioned in commencement certificate with respect to standard operating procedure for excavation and blasting and conditions related to strategy for mitigation of air and noise pollution, in such case action as per the provisions of the MR&TP Act, 1966/MMC Act, 1949 shall be taken and NMMC should decide the penalties to be imposed for such noncompliance.
- Penalties for the noncompliance of matters related to MPCB, PESO and Police Commissioner are also applicable as per the respective office.

11. CAPACITY BUILDING AND STAKE HOLDERS/DEVELOPERS/ ARCHITECTS CONTRACTORS OUTREACH PROGRAM-

- For effective implementation of the air and noise pollution mitigation plan and to take measures to reduce the nuisance to surrounding area due to blasting operations workshops on capacity building for all stakeholders will be undertaken.

12. TASK FORCE

- Task Force will be constituted comprising of below mentioned officers for implementation of the Air and Noise Pollution Mitigation Action Plan and tackling nuisance caused due to Excavation and Blasting operations on construction sites.

Role	Designation of the Authority
Action taking Authority	Ward Officer (concerned ward)
Supervising Authority	Assistant Director Town Planning, NMMC

❖ The objectives of Task Force-

- The Task Force will visit the Projects, Sites to inspect the compliance as per guidelines/actions within a week.
- If non-compliance is reported, the Task Force will take penal action with the approval of the Hon. Municipal Commissioner/Asst. Director of Town Planning, NMMC.
- The Task Force will submit weekly action taken report to the concerned Asst. Director of Town Planning, NMMC.

❖ **Works by other Agencies & Departments-**

- NMMC's Task Force as mentioned above shall be empowered to visit & inspect Construction/Projects by other agencies/departments such as MHADA, MIDC, MMRDA, MB & PWD, Railways, Maharashtra Forest Department, etc. & take necessary actions as mentioned above.

13. REVIEW


- The enforcement & implementation of Guidelines & Actions will be reviewed by respective Ward Officer /Assistant Municipal Commissioner on a weekly basis.


14. CORRECTIVE MEASURES


- Inventory Data & Action Taken Report (ATR) will be submitted on a monthly basis for progress review and further corrective measures to Hon. Municipal Commissioner, NMMC.

References:


1. Solid Waste Management Rules, 2016.
2. C&D Waste Management Rules, 2016.
3. Central Pollution Control Board (CPCB).
Circular on harmonization of classification of industrial sectors.
4. Maharashtra Pollution Control Board (MPCB).
Guidelines for citing criteria of Ready-Mix Concrete (RMC) plant, 2016.
5. Central Pollution Control Board (CPCB).
Guidelines on Environmental Management of C&DWastes, March 2017.
6. Central Pollution Control Board (CPCB).
Guidelines on Dust Mitigation Measures, November 2017.
7. Hon. Supreme Court Order vide SLP (Civil) No. D23708/2017 Dtd. 15.03.2018.
8. Central Pollution Control Board (CPCB), Maharashtra Pollution Control Board (MPCB).
Revised Action Plan for Control of Air Pollution in Non-Attainment Cities of Maharashtra- Navi Mumbai City Action Plan, 2019.
9. IS Code 4081-1986



Additional
Commissioner – 2,
NMMC



Additional City
Engineer, NMMC


Asst. Director of Town
Planning, NMMC

Deputy
Commissioner of
Police


Chief Scientist CSIR-
CIMFR, Dhanbad


Regional Officer,
MPCB Mumbai


Dr. Keshav Sangale, HOD –
Structural Engg.
department, VJTI

Absent
Representative of
the Petroleum and
Explosive Safety
Organisation