Risk Assessment Report

For

CRPF campus, Gwalior M. P.

“Proposed Reconstruction of Municipal Dispensary and Staff Quarters at Banganga in D ward, at C.S. No. 18, Malbar Hill Division”

Project By

MCGM

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About the project:

The Municipal Corporation of Greater Mumbai (MCGM) has proposed to undertake reconstruction of municipal dispensary and staff quarters at Banganga in D-ward on plot bearing C.S.No-18 of Malabar Hill division. Since, this proposed dispensary at Banganga is the only healthcare facility available for the local residents; the project needs to be expedited as soon as possible.

Earlier there was a Municipal Dispensary and Health Post at Banganga-D ward. The said building was ground + 4 upper floors which was old RCC structure. Dispensary & health post on ground floor and residential staff quarters on upper 4 floors.

Over a period the building got detoriated and was declared as dilapidated building by MCGM. Thereafter the dispensary was closed from 1/4/2003 due to decrease in attendance of patients and the health post was shifted to nearby Kavle Math Municipal School on 27/06/2009.
The dilapidated municipal dispensary was demolished and same is verified by MCGM office staff during their visit on 18.1.2013. Now the Plot is vacant for construction of Dispensary.

Purpose of Project:

The proposed reconstruction of Municipal Dispensary & Staff Quarters comprise of ground + 4 upper floors. Ground + Upper 2 floors Municipal dispensary and 3^{rd} + 4^{th} Upper floors – Staff quarters. As per the DP remarks the land under reference falls in Residential zone and with Coastal regulation zone as shown in the location plan and development.

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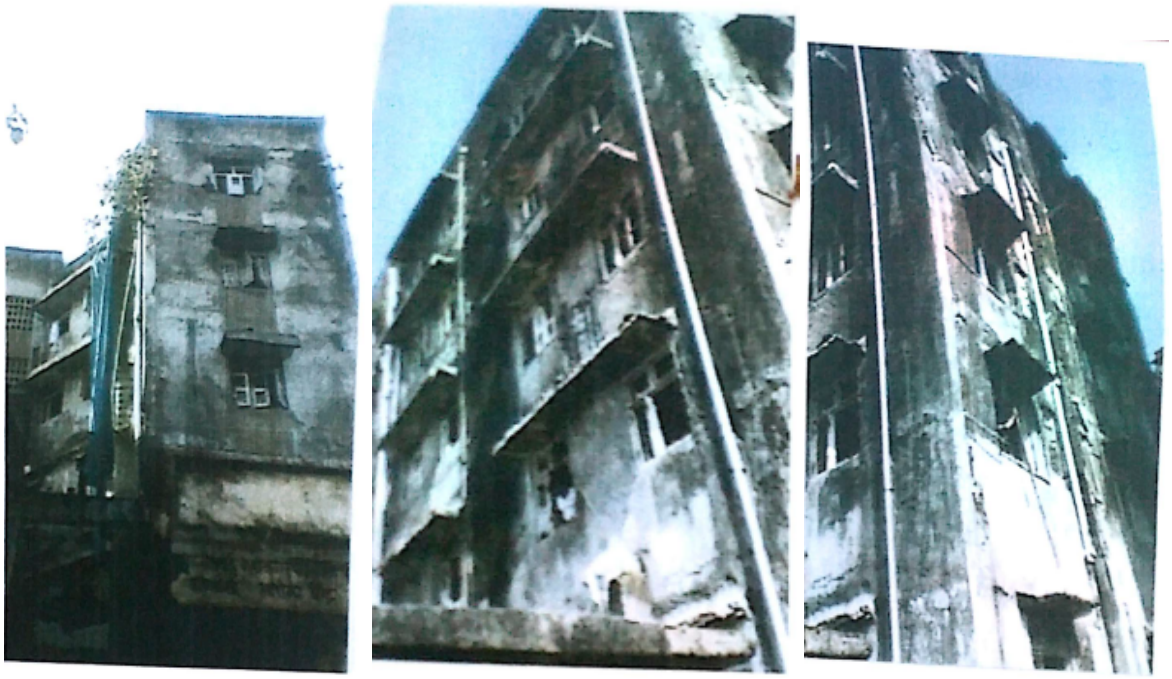
Following are the photographs of the dilapidated Municipal Dispensary.



Since RCC structure of G+4 upper floors were extremely dilapidated and beyond repair the same was decided by MCGM to demolish and reconstruction of the same building on the same plinth area with some modified requirement s of Health post and dispensary are now proposed.

The process of Demolition of Existing structure was carried out in January 2011 and Same is verified by MCGM office staff during their site visit 18.1.2013

The proposal is extremely important looking at the need of the Health care facility in the area.

Brief about of Risk Assessment

Risk Assessment

All projects, whether Construction or Industrial do have some pitfalls. The gravity of such happenings depends on Project location, Activities proposed, type of resources required, man power utilized and general working environment etc.

The principal objective of the risk assessment study is to identify and quantify the major hazards and the risk associated with the development of project. In this case it is the reconstruction of municipal dispensary and staff quarters at Banganga in D-ward on plot bearing C.S.No-18 of Malabar Hill division. Various phases of project such as construction phase and operations phase of the proposed project may lead to emergency consequences (disasters) affecting the public safety and health. Based on this information, an emergency preparedness plan is to be prepared to mitigate the consequences. Accidents/ Mishap result in great personal and financial loss. Many activities involve in construction process that have the potential for accidents which may impact work place, work force, environment, or public.

Risk analysis involves the identification and assessment of risks; the neighboring populations are exposed to as a result of hazards during construction phase and operation phase of project under consideration. This requires knowledge of failure probability, credible accident scenario, vulnerability of populations etc. The risk analysis is often confined to maximum credible accident studies. In this chapter, the identification of various hazards, maximum credible accident analysis, and consequence analysis are addressed, which gives a broad identification of risks involved. Based on the risk assessment, management plan has been presented.

Risk in Construction Project

Construction sites are dangerous places where injury or death or illness can cause to workers. These can happen due to electrocution, falling from height, injuries from tools, equipment and machines; being hit by moving construction vehicles, injuries from manual handling operations, illness due to hazardous substance such as dust, chemicals, .etc. Even a nail standing up from a discarded piece of wood can cause serious injury if trodden on in unsuitable shoes.

A large number of construction workers are exposed to the risks of workplace accidents and occupational health problems such as manual handling, noise and vibrations, exposure to various hazardous chemicals in particular cement, asbestos, welding fumes, etc. Accidents and illness can be extremely costly for a construction firm. A worker who becomes ill or injured as a result to unlawful negligence can sue for compensation, which could turn into a significant amount, it is proved as a serious injury or illness.

Here comes the work of risk assessment.

Basically there are two parts in risk assessment:

1. Hazard identification
2. Hazard mitigation.

1. Hazard Identification:

Hazard identification is a part of risk assessment in which the hazards are identified for further investigation. Once the hazards are identified then proper measures can be taken to eliminate them by using different control methods. A classical definition of hazard states that hazard is in fact the characteristic of system/plant/process that presents potential for an accident. Hence all the components of a system/plant/process need to be thoroughly examined to assess their potential for initiating or propagating an unplanned event/sequence of events which can be termed as an accident.

The most frequent hazards/ involved in the current project i.e. construction project fall into two main categories

a) Hazards/risks that may cause occupational accidents, sometimes fatal, immediately or soon after they occur;
b) Hazards/risks that may cause occupational illness, sometimes also fatal, in the medium or long term (from a few hours to many years later).

The leading hazards involved in the current project are:

1. Construction related hazards at CRPF campus:

- Falls from height (from unguarded floors, platforms, scaffoldings, roofs, etc.);
- Caught in/between (malfunction of machinery, etc.);
- Cave in (malfunction of the shoring system, sloping missing in excavations, etc.);

- Electrocution (by contact with power lines, power tools, etc.); and
- Struck by (falling objects, etc.).
- Fire
- Bullets, Firing shells and Grenade (Used during Training of soldiers) due to presence of developed Firing ranges in existing CRPF campus.
- Noise (during gun fire, Used during Training of soldiers) due to presence of developed Firing ranges in existing CRPF campus.
- Storage of water causing spreading of water born disease or vector born diseases like malaria / dengue.

2. Natural hazards.

- Earthquakes
- Hailstorms
- Fires
- Droughts
- Floods

&

Industrial & Chemical disaster

Construction Related Hazards:

Falls from height

A fall is defined as an event in which a person coming to rest unintentionally on the ground or other lower level, not by the result of a major intrinsic event such as (stroke) or overwhelming hazard. Fall accidents are significant public health risk and a leading cause of nonfatal and fatal injuries among construction workers worldwide.

Caught In/Between

Caught-in or - between hazards are defined as: Injuries resulting from a person being squeezed, caught, crushed, pinched, or compressed between two or more objects, or between parts of an object. This includes individuals who get caught or crushed in operating equipment, between

other mechanical operations, between a moving and stationary object, or between two or more moving objects.

Cave In

There are many potential hazards when working in excavations and trenches. Probably the most common hazard at any work site is the threat of cave-in. A cave-in occurs when walls of an excavation collapse. Cave-ins can be deadly. Wall failures often occur suddenly, with little or no time for the worker to react. The weight of the soil crushes and twists the body, causing death or serious injury in a matter of minutes. Excavation and trenching are among the most hazardous construction operations. Cave-ins pose the greatest risk and are much more likely than other excavation-related accidents to result in worker fatalities.

Electrocution:

The exposure of a worker to a lethal amount of electrical energy is called electrocution. And of course, “lethal” means deadly. Perhaps not as common as other injuries on construction sites, electrocution still provides a very real and often deadly risk. Most electrical accidents result from One of the following three factors:

- Unsafe equipment or installation,
- Unsafe environment, or
- Unsafe work practices.

Some ways to prevent these accidents are through the use of insulation, guarding, grounding, electrical protective devices, and safe work practices

Struck By:

Construction sites are busy and full of potential dangers. One of these dangers is struck-by incidents. Construction workers are most often struck by heavy equipment and vehicles, falling or flying objects, and masonry or concrete walls under construction .Struck-by hazards are one of the four most deadly hazards found at construction sites. Struck-by hazards exist any time a worker could be struck or hit by an object. Working or walking below elevated work surfaces may expose you to falling objects.

Fire:

Construction sites are high risk areas for a number of reasons, many of them obvious. The danger of a potential fire breaking out is definitely one of these, with many construction sites playing host to numerous examples of the three elements required to start a blaze: a source of ignition, a source of oxygen, and a source of fuel.

Fires in these environments can be highly destructive, with damage to materials, delays to construction and risk to life among the consequences. With many occurring each year, it's important to understand some of the common causes, helping for safety to avoid fires from breaking out.

The existing CRPF campus also has Explosive storage and Firing ranges which is operational for training purpose. Any Accident or mishap may cause damage to the nearby construction area.

Noise (during construction as well as Existing Training campus)

The proposed project is in developed CRPF campus having Firing ranges and Explosive storage operational. During training of gunfire peak noise levels may go up to 160 decibels during gunfire. This may affect the workers working during construction or residents during operational phase.

2. Natural Hazards

1) Earthquakes:

Mumbai is vulnerable to various natural and manmade disasters. Looking towards the vulnerability it's very important to address all in a holistic manner for sustainable development. There are 28 districts that come under Zone –III, having moderate seismic risk.

2) Hailstorms:

There are no Hailstorms occurring in project site area.

3) Droughts:

With its vast expanse, geographical features and varying climate conditions, different parts of the State have been perennially prone to drought conditions.

4) Floods:

Average rainfall in Mumbai is about 242.2 cm. Flood related problems are arises in Mumbai city mostly rainy season. Some part of Mumbai city is flooded in rainy season.

Industrial & Chemical disaster:

Other than the Natural disasters the State is also affected by the manmade disaster. Recent industrial accident that Dombivli industrial unit blast on 26th May 2016. A blast at a pharmaceutical unit in a residential-cum-industrial area in Dombivali East killed five persons and left nearly 140 people injured Thursday.

The impact of the blast at Probace Enterprises was such that windowpanes of all buildings within a 1.5 km radius were shattered, causing injuries to many.

Five bodies have been found so far. Rescue operations continued late into Thursday night.

"Among the injured, 59 have been discharged while the rest are still in hospital," said Joint Commissioner of Police Ashutosh Dumbare. He added that the rescue work was conducted by National Disaster Response Force and fire brigade officials. But the project site is far away from the MIDC areas in Mumbai.

2. Hazard Mitigation

A. Falls from height

Hazard mitigation is any cost-effective and sustained action taken to reduce the long-term risk to human life, property, and infrastructure from hazards.

Hierarchy for safe work at height

AVOID the risk by not working at height. Where it is reasonably practicable to carry out the work safely, other than at a height, then do so.

PREVENT falls. Where it is not reasonable practicable to avoid working at height, you should assess the risks and take measures to allow the work to be done whilst preventing (so

far as is reasonably practicable) people or objects falling. This might include ensuring the work is carried out safely from an existing place of work; or choosing the right work equipment to prevent falls.

MITIGATE the consequences of a fall. Where the risk of people or objects falling remains, you should take steps to minimize the falling distance and the consequences of such falls. This also involves the selection and use of work equipment.

B. Caught In/Between & Struck By

1. Machines must always be properly guarded. Workers should follow lock-out/tag-out procedures to prevent being injured when a machine is being repaired. Employers must train workers how to recognize and avoid these unsafe conditions.
2. Workers need to be trained on the dangers of passing between swinging structures of equipment (like a crane) and other solid objects. Barricades should be used to keep workers out of the area within the swing radius of the equipment. Employers must train workers how to recognize and avoid these unsafe conditions.
3. Follow proper lockout/tag out procedures whenever you repair or maintain equipment and machinery. Turn off any and all vehicles whenever you do any repair or maintenance work. Block wheels of vehicles to stop movement, and make sure you are properly trained to work safely on this equipment. Lower or block the blades of bulldozers, scrapers and similar equipment when making repairs or when they are not in use.

C. Cave In

1. Keep heavy equipment away from trench edges.
2. Identify other sources that might affect trench stability.
3. Keep excavated soil (spoils) and other materials at least 2 feet (0.6 meters) from trench edges.
4. Know where underground utilities are located before digging.
5. Inspect trenches at the start of each shift.
6. Inspect trenches following a rainstorm or other water intrusion.
7. Do not work under suspended or raised loads and materials.
8. Inspect trenches after any occurrence that could have changed conditions in the trench.

9. Ensure that personnel wear high visibility or other suitable clothing when exposed to vehicular traffic.

D. Electrocution

In this case this hazard is negligible as there are no power lines in campus but operations are powered by DG sets.

E. Struck by

Accidents with vehicles are another type of struck-by incident. To avoid these incidents, workers should be aware of the location of other people when operating large vehicles and they should wear brightly colored clothing when working near these vehicles. Workers should also inspect vehicle safety systems frequently and observe lift or load capacity limitations.

F. Fire

To mitigate the fire risk and minimize the possibility of the outbreak of fires at construction sites, the following guidelines should be observed by building contractors and site workers:

1. **Storage of Combustible Materials** Combustible materials stored on site, whether outside or inside a structure, should be well stacked in an orderly manner and to the minimum. Ample separating spaces should be provided to each stack both from the top and the sides
2. **Storage of Dangerous Goods** All dangerous goods shall be stored in appropriate Dangerous Goods Stores approved by the Director of Fire Services. Unused dangerous goods should be returned to and stored at Dangerous Goods Stores. Safety precautions on the use of dangerous goods should be observed at all times.
3. **Housekeeping** Good housekeeping will reduce the chances of a fire, rate of fire spread as well as injuries/fatalities. Things to observe include:- (i) orderly storage of materials; (ii) periodical removal of discarded combustible packing materials, wood chips, saw dust, etc.; and (iii) an unobstructed exit route should always be maintained.

4. **Provision of Access** Substantial staircase(s) should be erected corresponding with the building of floor slabs to ensure the availability of escape route and access for firefighting purpose. Such staircase(s) should be maintained free from obstruction.
5. **Open Flame** Work Sparks from open flame work (welding, cutting, etc.) is, by large, the most common cause for fires in buildings under construction. Extreme care should therefore be exercised when carrying out any welding work. All combustible materials should be removed, where possible, from the immediate vicinity. A portable fire extinguisher should be placed at immediate readiness.
6. **Coating and Sealing Substances** Special caution is required in heating and boiling of the coating and sealing substances which are used as insulation and sealing materials.
7. **No Smoking Instruction** "No Smoking" signs should be prominently displayed and strictly observed in the construction are as especially where highly inflammable adhesives or solvents are used.
8. **Electric wiring** all electric wiring should be properly insulated and protected. Earth leakage circuit breakers should be installed to trip the supply when overloading of the circuit occurs.
9. **Fire Service Installations And Equipment** In order to maintain proper fire protection for construction site, one must have all Fire controlling equipments at site at strategic locations.
10. **Bullets, Firing shells and Grenade (Used during Training of soldiers)**

    The hazard from existing Training centre is minimum as it is far away from construction site, and it has restricted with boundary. The Explosive Store is around 500 to 900 mtrs away from the proposed development and is equipped with fire protection measures.

G. Noise (during gun fire, Used during Training of soldiers)

Training at firing range will have noise pollution and that too up to 160db, but the Firing range is surrounded with dense vegetation and is away around 500 to 900 mtrs from the proposed development. Also there will be tree barriers to create the natural segregation of Residential and training centre part.

Natural Hazards

In disaster situations, a quick rescue and relief mission is inevitable however damage can be considerable, can be minimized if adequate preparedness levels are achieved. Indeed, it has been noticed in the past that as and when attention has been given to adequate preparedness measures, the loss to life and property has considerably reduced.

The construction team members will be trained according to the identified natural disaster by an experienced training professional so that loss of lives and property is at its minimum during and even after the constriction practice has been finished.

Socio-Economic Impacts

The project shall be positive and beneficial to the society at large. It shall provide employment to local people.

Rehabilitation

The project does not involve any rehabilitation or displacement of any person.