Disaster Management Plan

Of

Proposed Project – "Acme - Ozone"

At

Gut No. 61/1/1, 61/1/2,3,4 & 61/2/1,2,3
Village Chitalsar –Manpada,
Taluka & District - Thane
Proposed by

M/s. Acme Realties Pvt Ltd

Prepared by

Enviro Policy Research India Pvt Ltd (EPRI)

9B, 1st Floor, Ramanand Premises,
Naupada, Gokhale Road,
Opp. Mango Showroom,
Thane (W) – 400601, Maharashtra
Phone: 022 - 25450210
Email: manager@eprindia.com;
Website: www.eprindia.com

TABLE OF CONTENTS

No.	Topic	Page No.
	Disaster Management Plan	
1.1	Introduction	4
1.1.1	Location of the proposed project	4
1.2	Risk Assessment and Vulnerability analysis	7
1.3	Mitigation and Preparedness	10
1.3.1	Standard Operating Procedures (SOPs)	10
1.4	Evacuation Plan	15
1.5	Emergency Response plan	18
1.6	Inventory Resources	19
1.7	Warning System and information sharing	22
1.8	Road Map of Fire Stations	24
1.9	Do's and Don'ts for Disasters	26
1.10	Conclusion and Recommendation	29
1.11	DMP Costing	36
1.12	Fire Tender Movement and DG set Location	38

LIST OF TABLES

No.	Topic	Page No.
1.1.1	List of building & their approval status	5
1.2.1	Seasonal disaster mapping	8
1.3.1	Codes that would be followed by Developer	11
1.3.2	Codes to be followed by developer during construction phase	12
1.6.1	List of different NGOs near the proposed site	20
1.6.2	List of hospitals near proposed project	21
1.8.1	Details of Fire Stations near proposed project	22
1.10.1	Steps for Management during disaster	32
1.10.2	Actionable Points for Disaster Management Strategies	34
1.11.1	DMP Cost for Operation Phase	36
1.11.2	DMP Cost for Construction Phase	36

LIST OF FIGURES

No.	Topic	Page No.
1.1.1	Location of the proposed project	4
1.1.2	Layout Plan of the proposed project	5
1.1.3	Features of Disasters	6

1.1.4	Different categories of Disasters	7
1.2.1	Step wise flow diagram for risk assessment and vulnerability analysis	8
1.4.1	Evacuation plan of Typical Floor for Eucalypta building	16
1.4.2	Evacuation plan of Refuge Floor for Eucalypta building	16
1.4.3	Evacuation plan of Typical Floor for Fennelia building	17
1.4.4	Evacuation plan of Reguge Floor for Fennelia building	17
1.5.1	Emergency Action Plan	18
1.6.1	Location of nearby Hospitals	22
1.8.1	Road map from Balkum Fire Brigade to proposed site	25
1.8.2	Road map from Majiwada Fire Brigade to proposed site	25
1.10.1	Disaster management cell	30
1.12.1	Location of DG set	38
1.12.2	Fire Tender Movement Plan (Stilt Floor)	39

Disaster Management Plan

1.1 Introduction:

The proposed project is a development of residential project at Gut. No. 61/1/1, Gut. No. 61/1/2, 3, 4, 61/2/1, 2, 3 village Chitalsar -Manpada, Taluka& District Thane. The detail location is given in **Figure 1.1.1** and layout for the project is given in **Figure 1.1.2.**

1.1.1 Location of the proposed project:

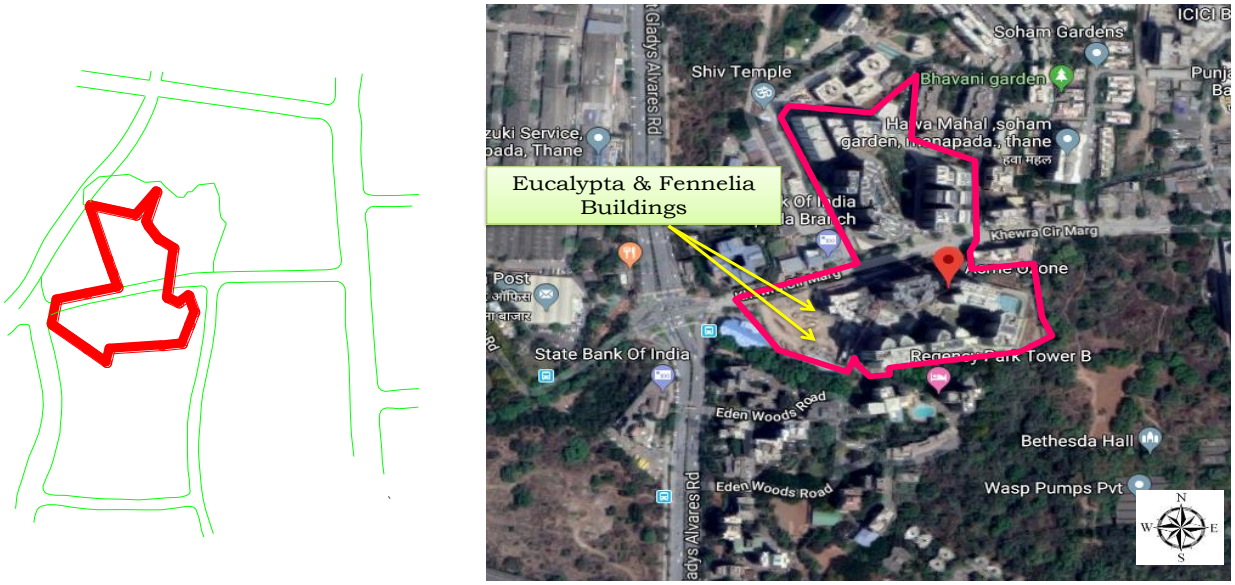


Figure 1.1.1 Location of the proposed project.

The layout of the proposed project is as follow in **Figure 1.1.2**

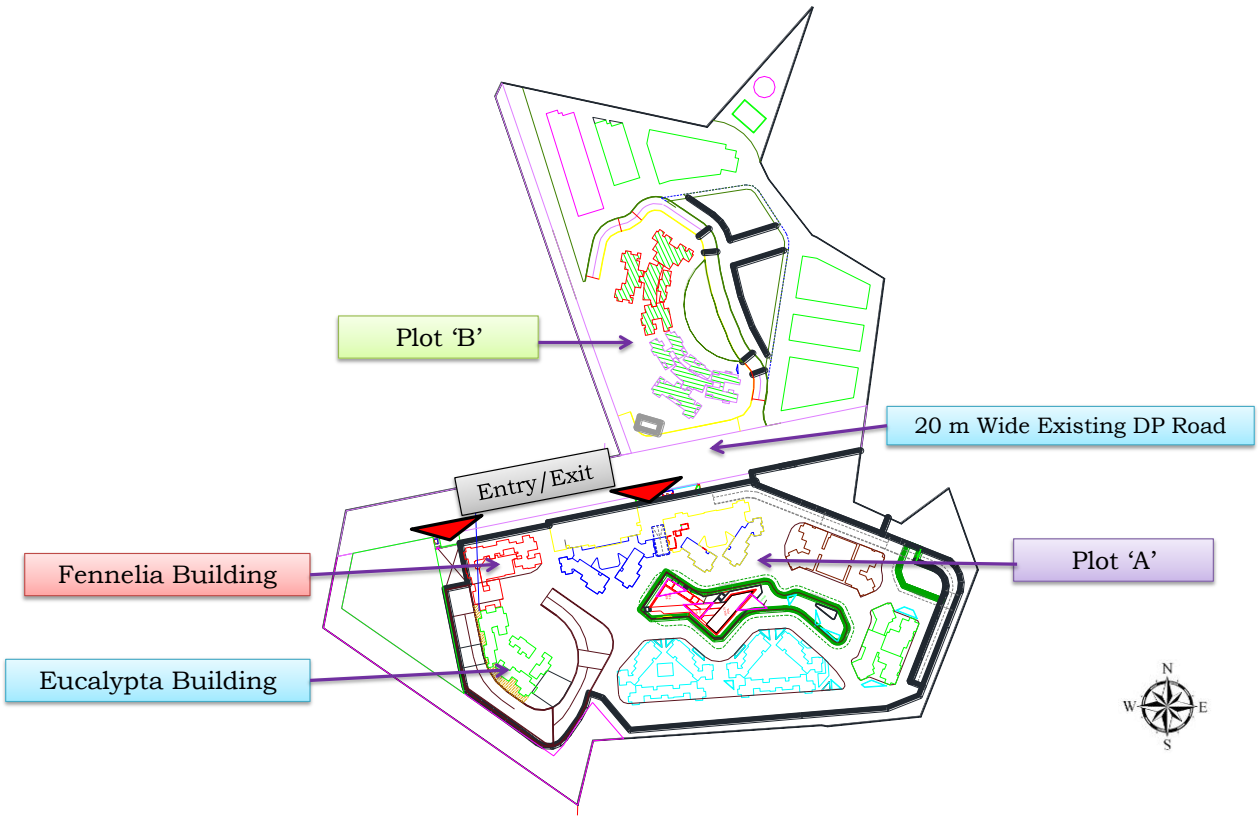


Figure 1.1.2: Layout Plan of the proposed project.

The project is constructed on a plot area of 54,500 sq mt. The details of the construction and buildings are as depicted in the **Table No. 1.1.1** below. Among the below mentioned buildings, Eucalyptia and Fennelia buildings are proposed for amendment in the proposal.

Table No. 1.1.1 List of buildings and their approval status

Sr. No.	Building Name and Number	Remarks
1	Plot – A Alpinia Building No. 1	Approved
2	Plot – A Basilia Building No. 2	Approved
3	Plot – A Centilia Building No. 3	Approved
4	Plot – A Dendelia Building No. 4	Approved
5	**Plot – A Eucalyptia Building No. 5**	**Proposed for amendment**
6	**Plot – A Fennelia Building No. 6**	**Proposed for amendment**

7	Plot – A Gingelia Building No. 7	Approved
8	Plot – A Herbelia Building No. 8	Approved
9	Plot B – Oakwood	Approved
10	Plot B – Ashwood	Approved
11	MMRDA – Building No. 1	Approved
12	MMRDA – Building No. 2	Approved
13	MMRDA – Building No. 3	Approved
14	MMRDA – Building No. 4	Approved
15	MMRDA – Building No. 5	Approved
16	MMRDA – Building No. 6	Approved

Disaster is a sudden, calamitous event bringing great damage, loss, and destruction and devastation to life and property. The damage caused by disasters is immeasurable and varies with the geographical location, climate and the type of the earth surface/degree of vulnerability. This influences the mental, socio-economic, political and cultural state of the affected area. Following are the main features of disaster given in **Figure 1.1.3**. Disasters are classified in different categories that are listed in **Figure 1.1.4**.



Figure 1.1.3 Features of Disasters

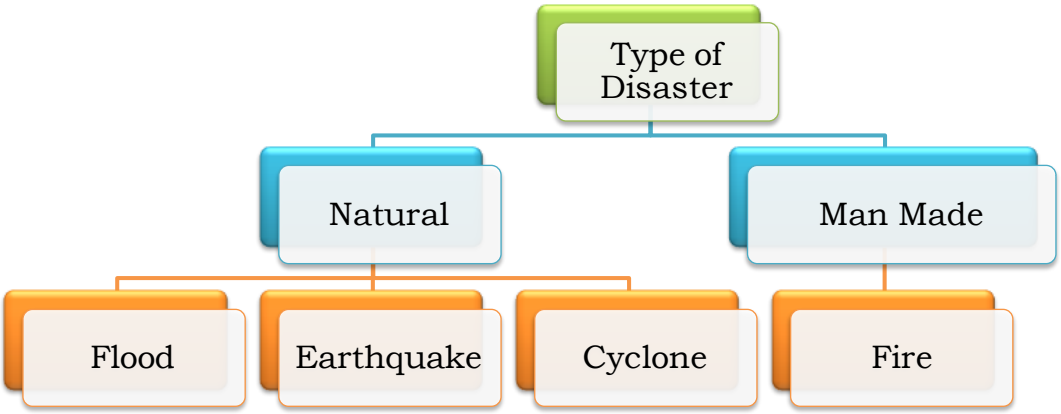


Figure 1.1.4: Different categories of Disasters

1.2 Risk Assessment and Vulnerability analysis

Without Vulnerability there is no disaster. The process of Risk assessment starts with the assessment of potential disasters through a combination of hazards mapping and vulnerability analysis.

The proposed project encompasses the lives of a large number of people. It also involves installation of various structures that meet the comfort and needs of population but may also pose the serious threat to the occupant in case of accident. It is thus considered necessary to carry out a risk assessment and disaster management plan for the project.

Risk assessment was carried out by following phases shown in process flow diagram below in **Figure 1.2.1**

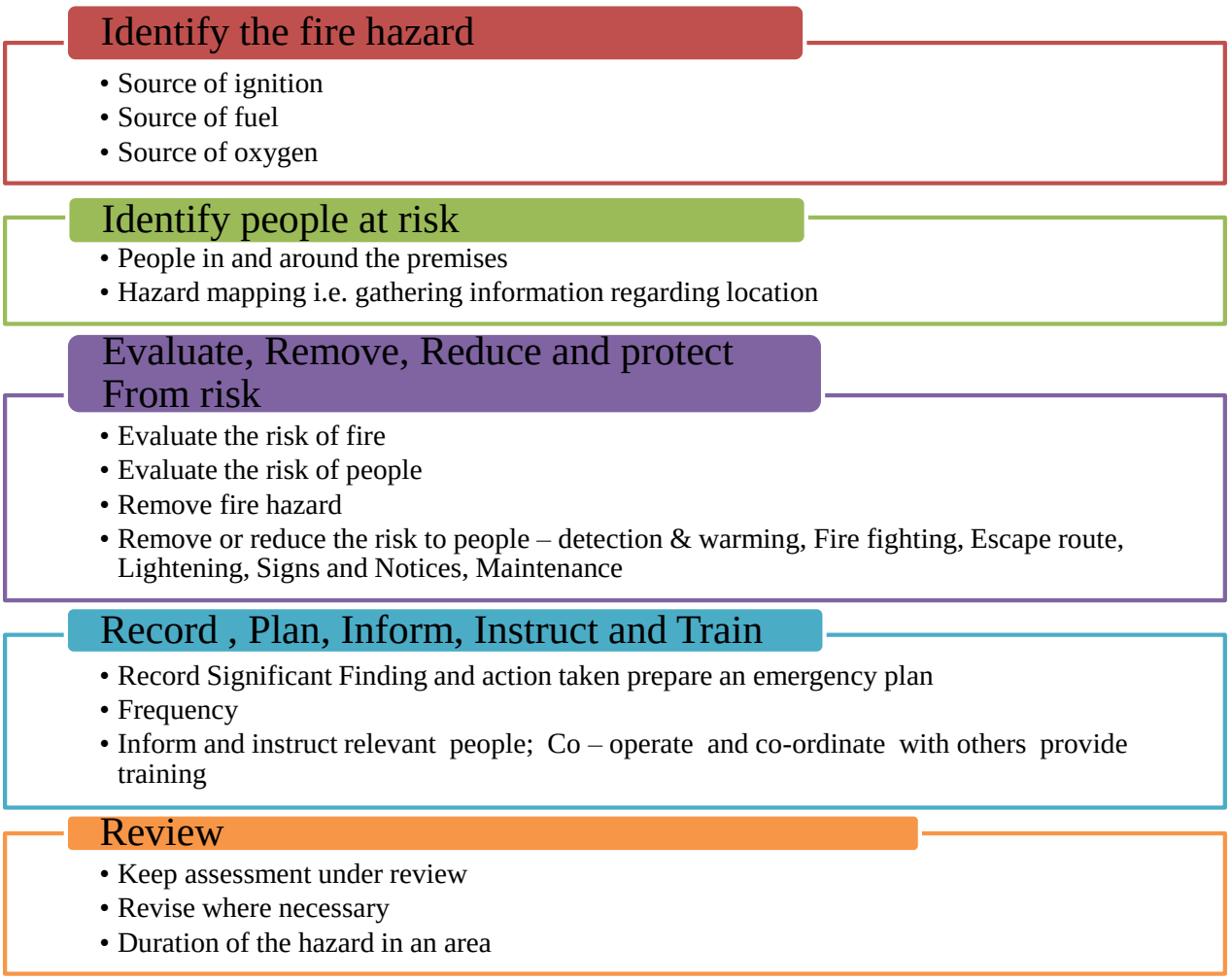


Figure 1.2.1: Step wise flow diagram for risk assessment and vulnerability analysis

All these hazards could occur at different time period. They could vary seasonally, especially natural hazards like flood and cyclone. Manmade hazards could occur at any time of the year. Similarly, earthquake and Tsunami could occur at any time of the year, depending on climatic conditions. A seasonal hazard mapping for different disasters is presented in **Table 1.2.1**.

Table 1.2.1: Seasonal disaster mapping

Type of Disasters	Vulnerability Mapping	Remark	Seasonal Mapping
Floods	The vulnerability of floods at the proposed site would depend on the drainage pattern, sewerage system, and heavy rainfall and others	PP have provided the storm water drainage for the proposed project. There will be provision of stilt to avoid the direct flood water entry in the building.	Mainly from July-September as there is possibility of heavy rainfall, H, A and I are affected

Cyclone	Cyclone is formed in condition when warm sea (temperature in excess of 26^{o}C to a depth of 60 m) with abundant and turbulent transfer of water vapors to the overlying atmosphere by evaporation	The proposed site is around 45 km away from Arabian sea. There are many structures in between. This reduces the probability of severe cyclone.	Considered from April to December as it requires Hot and humid climate. Affected are H, A, I
Earthquake	Proposed site is located in Thane which falls under Earthquake Zone III, moderate risk zone, as per the map showing seismic zones of India IS 1893 (Part I) : 2002.	Management plan for Earthquake is highlighted below.	This is a natural calamity that could take place at any point of time. The affect is seen on H, A and I
Fire	Fire accidents could take place due to improper maintenance of electrical wiring, faulty wiring and gas leakage etc. Carelessness is one of the major factors for fire hazards.	Fire Hazard is considered in the study and an evacuation plan is also designed for the proposed project Provision has been made for 6 m driveway for movement of fire tender.	It can occur at any point of time and H, A and I are affected by it

H: Human, A: Animals, I: Infrastructure

The proposed project is a development of residential project at Gut. No. 61/1/1, Gut. No. 61/1/2, 3, 4, 61/2/1, 2, 3 village Chitalsar -Manpada, Taluka& District Thane. It could face various challenges from both natural and man-made hazards as highlighted in previous section. Some of the precautionary measures that could be taken in case of disasters in terms of social aspects are highlighted in consequence section of this chapter.

Steps involved in Disaster Management

1) **Prevention:** Prevention activities Aims to reduce the probability of disaster occurrence through measures meant to avoid adverse effect
2) **Mitigation:** Minimizing or reducing the impacts of disaster mitigation measures include building codes, vulnerability analyses updates, zoning and land use management, building use regulations and safety codes, preventive health care, public awareness and education.
3) **Preparedness:** We have prepared the emergency plan. Emergency exercises we will be carried out during construction & operation phase; like warning systems mock drills, and training

4) **Response:** Efforts to minimize the hazards created by a disaster i.e. rescue, emergency relief, medication.

1.3 Mitigation and Preparedness

1.3.1 Standard Operating Procedures (SOPs)

A. Cyclones and Floods

- Community awareness and mass education program would be arranged in association with NGO to manage the challenges during and after floods and cyclones.
- Residents would be made aware to switch off electrical mains at emergency situation.
- Residents would be educated about Do's and Don'ts during cyclone and Floods.
- Developer would construct an embankment/flood wall around the proposed site.
- Proper maintenance of storm water channel and sewer lines.
- Developer would build the proposed building with all the measures to withstand high wind velocity.
- Developer would identify large scale medical store.
- Awareness would be spread about the hazards of stored water. Communicable diseases like malaria, dengue, etc. could spread if water is stored for longer time.
- Building would be investigated for leakages and any leakage would be repair by developer at low cost. After the formation of society, developer would assist in this activity.
- Follow the instructions of local authorities

B. Earthquake

- Developer may tie-up with local newspaper, radio or television station to:
  - Provide series of information on locating hazards in homes, workplaces, day care centers, etc.
  - Provide tips for earthquake drills.
  - Run interviews with representatives of the gas, electric, and water companies about how individuals should prepare for an earthquake.
- Developer would assist concerned authority in repair and strengthening tips for exterior features, such as porches, front and back decks, sliding glass doors, canopies, carports, and garage doors.

- Developer would provide up-to-date building codes to the society manager or the concern authority. National building codes would be made available to the concern authority
- Developer would prepare a disaster emergency kit which would be maintained at society office.
- Developer would follow seismic building standards and land use codes that regulate land use along fault lines, in areas of steep topography, and along shorelines.
- Some municipalities, counties, and states have enacted codes and standards to protect property and occupants in case of an earthquake. Code that would be followed by developer is given in **Table 1.3.1**

Table 1.3.1: Codes that would be followed by Developer

Codes	What it says
IS:1893 (Part 1)	General provisions and Buildings
IS:1893 (Part 2)	Elevated and Ground Supported Liquid Retaining Structures
IS:1893 (Part 3)	Bridges and Retaining Walls
IS:4326	Earthquake Resistant Construction
IS:13920	Ductile Detailing of Reinforced Concrete Structures
IS:13827	Earthen Dwellings
IS:13828	Low Strength Masonry Structures
IS:13935	Seismic Strengthening of Structures

C. Water Scarcity Management

- Developer would maintain a backup water tank for minimal water requirement (for drinking and sanitary practices).
- Residents would be provided with booklet that would highlight measures to save water and importance of water.
- Recycling of waste water would be followed.
- Ultra low flow faucets and flushing devices could be installed by developer
- Developer would tie up with NGOs to promote development of emergency low cost water treatment plant.
- Developer would assist in finding tanker water supplier.
- Developer would provide chemical standards for drinking water to all the residents. They would display the same in lobbies and the same would be maintained by society manager.

If any amendment is made in Indian drinking water standard, then it would be provided to society manager by developer.

- This list of standard would include health hazards and treatment process as well. BIS standard would be shared with resident by developer.

D. Construction Phase Management

- Developer would not allow any child labour.
- Developer would evaluate health status of both skilled and unskilled workers on regular basis. If any workers found to have any diseases, then he/she would be transferred to a different sector depending on their skills. If any worker is to be removed for health reason, then developer would provide compensation as per Workmen compensation Act, 1923.
- Developer would provide wages as per Payment Wages Act, 1936 and Minimum Wages Act, 1948.
- Other act that would be followed by developer for workers, The Buildings and other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996.
- Similarly, developer would follow standard specifications for construction workers as well as for construction activities. These specifications and codes that to be followed are given in **Table 1.3.2.**

Table 1.3.2: Codes to be followed by developer during construction phase

Publication	Code no
Safety code for handling and storage of building material	IS 7969-1975
Safety code for scaffolds and ladders	IS 3696 (Part-I & II)-1987 & 1991
Safety code for working with construction machinery	IS 7293-1974
Safety code for excavation work	IS 3764-1992
Safety requirements for floor and wall openings, railings and toe boards	IS 4912-1978
Safety code for demolition of building	IS 4130-1991
National building code of India, 2016	Part-VII
Safety code for erection of structural steel work	IS 7205-1974
Steel scaffoldings	IS 2750-1964
Code of practice for structural use of unreinforced masonry	IS 1905-1987
Code of practice for design and construction of foundations in soils: General Requirements	IS 1904-1986

- All the storage area must be under the supervision of skilled and qualified staffs.

- Safety manager would be appointed by developer and that person would be responsible for managing all safety related activities on the site.
- Some of the immediate measures that would be adopted by developer:
  - Construction and maintenance of safety facilities such as access roadways, pedestrian routes, barricades and overhead protection.
  - Safety signs would be installed at various location of construction site. It must be in Hindi, Marathi and English languages.
  - Testing of lifting machinery such as cranes and goods hoists, and lifting gear such as ropes and shackles on regular basis.
  - Inspection and rectification of access facilities such as scaffolds and ladders.
  - Inspection and cleaning of welfare facilities such as toilets, clothing accommodation and canteens.
  - Transmission of the relevant parts of the safety plan to each work group.
  - The organization and conduct of safety training programs, including induction training for all workers on the site.
  - The investigation and review of the circumstances and causes of accidents and occupational diseases so as to advise on preventive measures.
  - Necessary protective equipment would be provided by developer.
  - First aid kit box would be maintained at site engineer and safety manager office.
- Noise control measures include:
  - Workers would be advised to switch off the machines when they are not in operation.
  - Workers would be advised and trained to keep compressor motor covers closed when they are running.
  - Workers would be advised to wear ear plugs while working with noise related machines.
- Other sanitary services that would be provided are:
  - One wash basin per 30 workers would be installed at construction site.
  - Proper water supply would be made available for all workers. This water would be made available through tankers.
  - Toilet and urinal facilities would be provided in adequate number.
  - Drinking-water containers should be placed in cool and protected areas. These containers must be made from impermeable materials with suitable covers. The

containers should be cleaned regularly by a designated person. The drinking water must be tested for chemical and bacteriological parameter on regular basis. Developer could tie up with nearby institute to carry out this activity.

- Meal area or canteen should be cleaned properly by authorized personnel.
- Toilet and washroom facilities would be provided.

E. Fire Hazard

- List of nearby fire stations and hospitals would be displayed at lobbies and society office room.
- The road map of nearby fire stations would be displayed at lobbies, society office room by developer and the same would be maintained by concerned authority.
- Developer and concerned authority would be given booklet for Do's and Don't for fire hazard.
- Developer would follow the appropriate building codes for construction of proposed building.
- Developer would follow appropriate norms for electrical wiring system to minimize the fire hazards.
- Evacuation plan would be shared with all the staff members, residents and the same would be displayed at each floor lobbies and society office. The same plan would be maintained by concerned authority.
- Importance of assembly point and its location would be highlighted by developer.
- An underground water storage tank of would be provided for firefighting measures.
- Electric supply to these pumps would be on independent circuit.
- Walls enclosing lift shaft would have 2 hours fire resistant capacity.
- There will be provision clear 6 m all around the buildings. This will be helpful for the fire tender movement.

F. Vehicle Accidents

- Project site have internal roads with more than 6 meter driveways, which can sufficiently cater to vehicular needs at the project site.
- Traffic flow to and within the site will be properly maintained so that there are no obstructions to existing traffic flow on access roads.
- Road side parking will not occur as sufficient parking arrangement is provided.

- Regular maintenance and upkeep of the internal roads within project site will ensure smooth traffic flow.

G. Malfunctioning of Lifts

- Due to Technical snap or power failure lifts could get stuck in between floors, or the wire could snap and the lift may fall down the shaft.
- Regular maintenance of lifts and other Building Management Systems has to be conducted.
- Specific committee should be appointed for maintaining the systems during the operation phase.

1.4 Evacuation Plan

Evacuation Plan for Typical and Refuge floor plans of Proposed Project Eucalypta and Fennelia building have been shown in **Figure 1.4.1 to Figure 1.4.4**

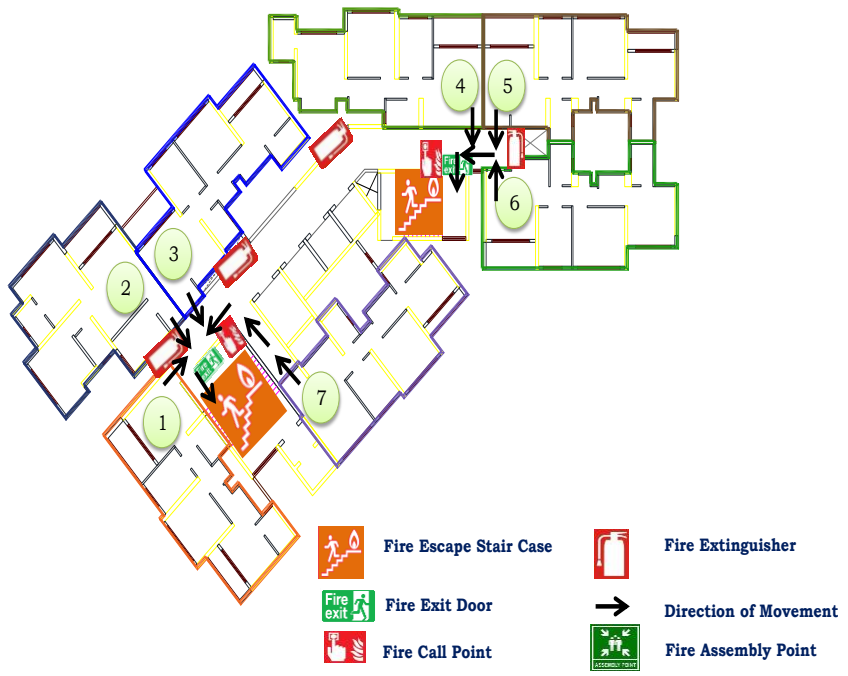


Figure 1.4.1: Evacuation plan of Typical Floor for Eucalypta building

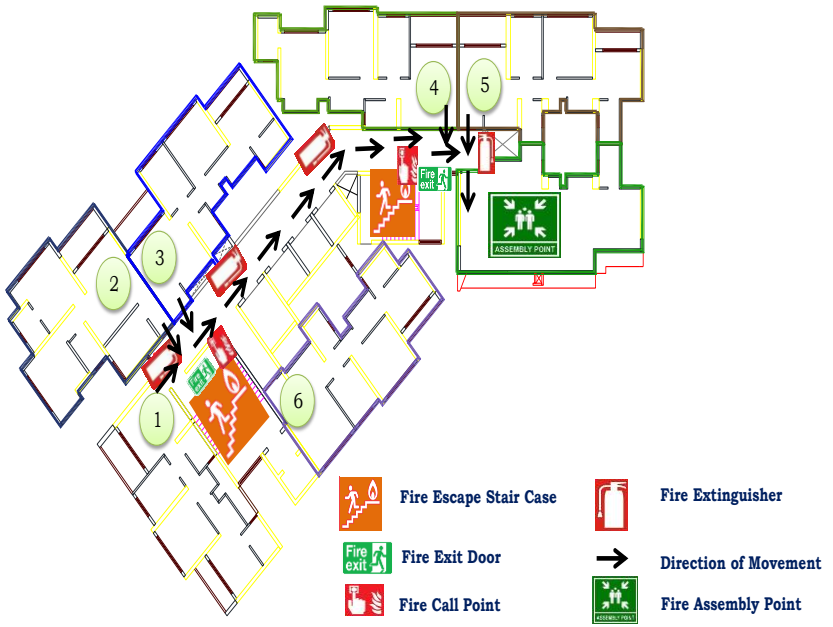


Figure 1.4.2: Evacuation plan of Refuge Floor for Eucalypta building

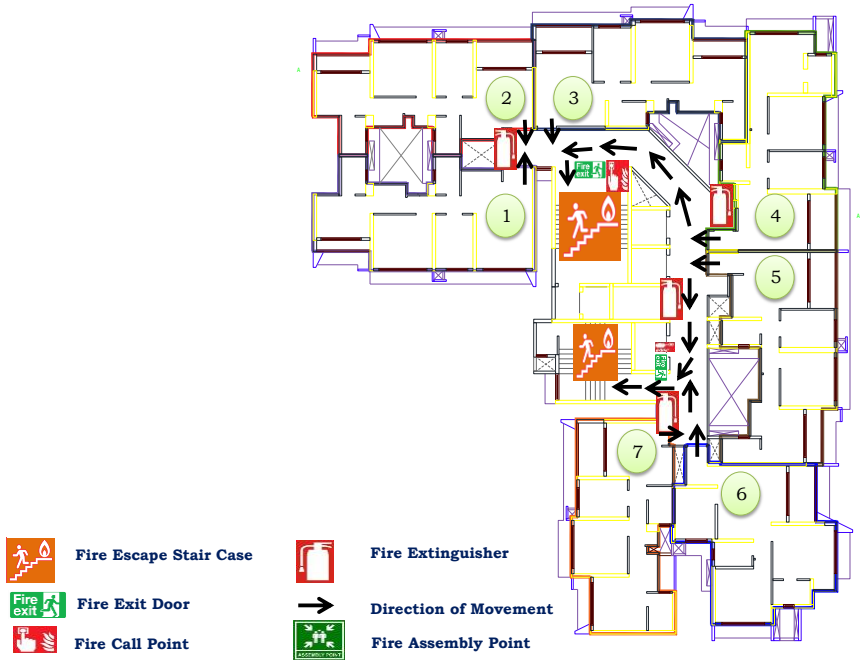


Figure 1.4.3: Evacuation plan of Typical Floor for Fennelia building

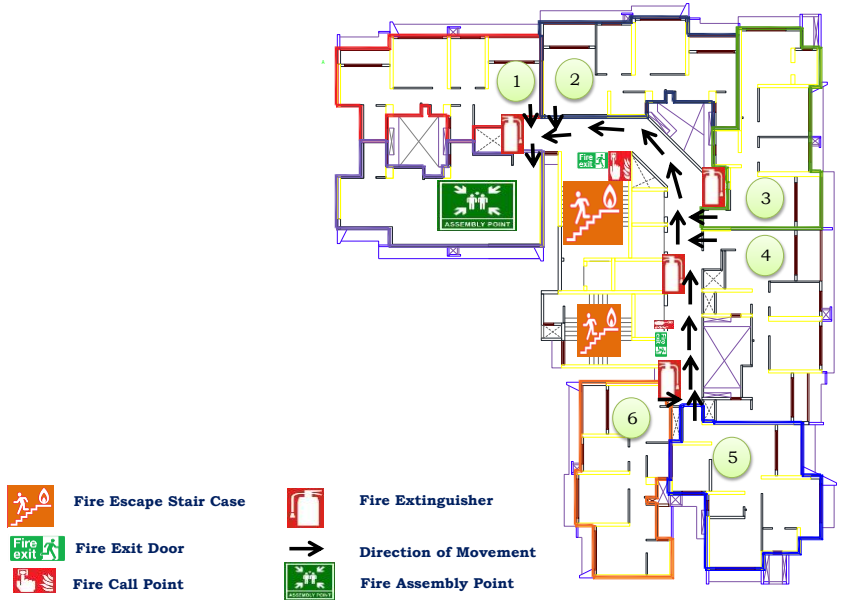


Figure 1.4.4: Evacuation plan of Refuge Floor for Fennelia building

1.5 Emergency Response plan

The idea regarding overall path to be followed during disaster is given in **Figure 1.5.1**

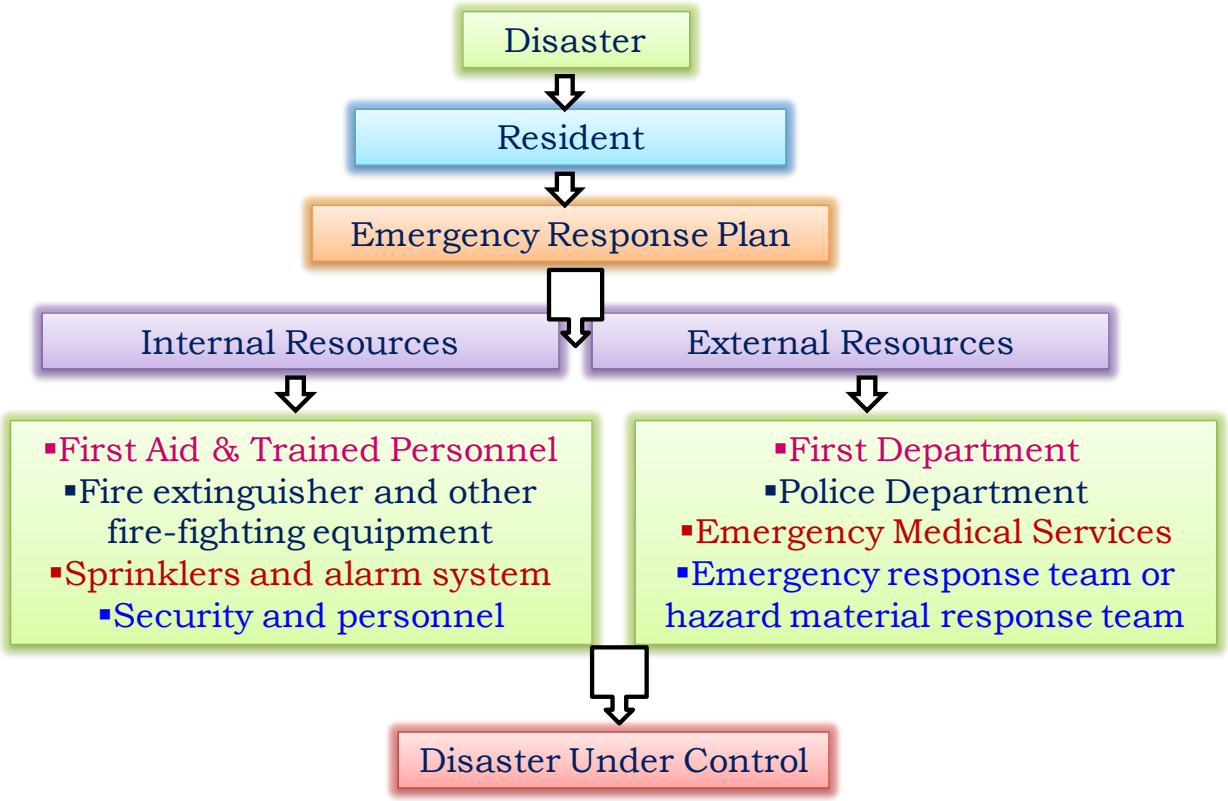


Figure 1.5.1 Emergency Action Plan

1.6 Inventory Resources

A. Disaster management Kit and First aid kit

- **Developer would prepare a disaster emergency kit which would consist of:**

1. Battery operated torch	2. Extra batteries	3. Battery operated radio
4. First aid kit and manual	5. Knife	6. Can opener
7. Essential medicines	8. Thick ropes and cords	9. Sturdy shoe
10. Candles and matches in a waterproof container		
11. Chlorine tablets or powdered water purifiers		

This kit would be maintained at society office

Detail of first aid kit box which is to be prepared and kept at every floor. This first aid kit box must be check and inspected by society manager and fire officer every week. The details of different medicines to be kept in first aid kit box are:

Bandages	Dettol/Savlon	Antiseptic cream	Medical tape roll
Dressing material	Sterila gauze pads	Adhesive bandages	Scissors
Antibiotics	Soap	Burnol	Crocin

B. List of NGO's

List of various NGOs and their functional area has been highlighted in the **Table 1.6.1.** These NGOs can be contacted for awareness creation and providing basic knowledge to the residents. Developers would provide such list to the society manager and the decision would be taken by society to conduct such awareness campaign.

Table 1.6.1: List of different NGO's near the proposed site

Name	Address	Contact no.	Functions
The Akshaya Patra Foundation in Thane	Old TMC School no:133, Ward no.8,, Vasantvihar, Near Pawar Nagar bus depo,, Thane(west),, S.R. Pawar Nagar, VasantVihar, Thane West, Maharashtra 400607	99678 00390	No child in India shall be deprived of education
Global Vision Cancer Care NGO	Office No. 29, 1st Floor, Cine Wonder Mall, Ghodbunder Road, Thane West, Kapurbawdi, Thane West, Maharashtra 400607	25896589	Aim of helping needy cancer patients and mission of Cancer Free India
MA Niketan	Pokharan Rd Number 2, Siddhachal Housing Society, Pawar Nagar, Thane West, Maharashtra 400610	2820 8974	To reach out to the powerless and the voiceless, especially women and children and empowering them.
Green Health Foundation (GHF)	219, Gopi Cine Mall, Nana Shankar Sheth Road, Dombivli West, Dombivli, Maharashtra 421202	070453 15770	Design, promote and implement solutions towards sustainable and healthier living
WTERT	Ground floor, Shree Samarh Tower, Opp. Gandhar Tower, J. A. Rual Marg, off, Sayani Rd, Prabhadevi, Mumbai, Maharashtra 400 025	022 2421 0363	Works in Sustainable waste management.

C. List of Hospitals

List of hospitals near proposed project is given in **Table 1.6.2 and Figure 1.6.1.** Proposed project would be displaying this list of hospital in lobbies or appropriate locations and society office rooms. Also they would share the same list with concerned authority and residents. So as the time of emergency, one could contact any of the hospitals for early response.

Table 1.6.2: List of hospitals near proposed project

Name	Address	Phone Number
Bethany Hospital	Unnathi Gardens, Thane West, Thane, Maharashtra 400606	022 2172 5111
Jupitar Hospital	Eastern Express Highway, Service Rd, Next To Viviana Mall, Laxmi Nagar, Thane, West, Maharashtra 400601	022 2172 5555
Highland Super Specialty Hospital	Highland Park, Above D-Mart, Dhokali, Kolshet Road, Thane West, Kailash Nagar, Thane West, Thane, Maharashtra 400607	022 2584 0300
Hiranandani Hospital	Hamilton B, Regency Street Hiranandani Estate, Off Ghodbunder Road, Patlipada, Thane West, Hiranandani Estate, Thane West, Thane, Maharashtra 400607	022 2545 8666
Titan Hospital	Soham Plaza (North East), Ghodbandar Road, Near Tikujini Wadi, Manpada, Bhavani Nagar, Thane West, Bhavani Nagar, Thane West, Thane, Maharashtra 400601	022 4100 8000

Location of Nearby Hospitals

The locations of nearby hospitals from proposed project are shown in **Figure 1.6.1**

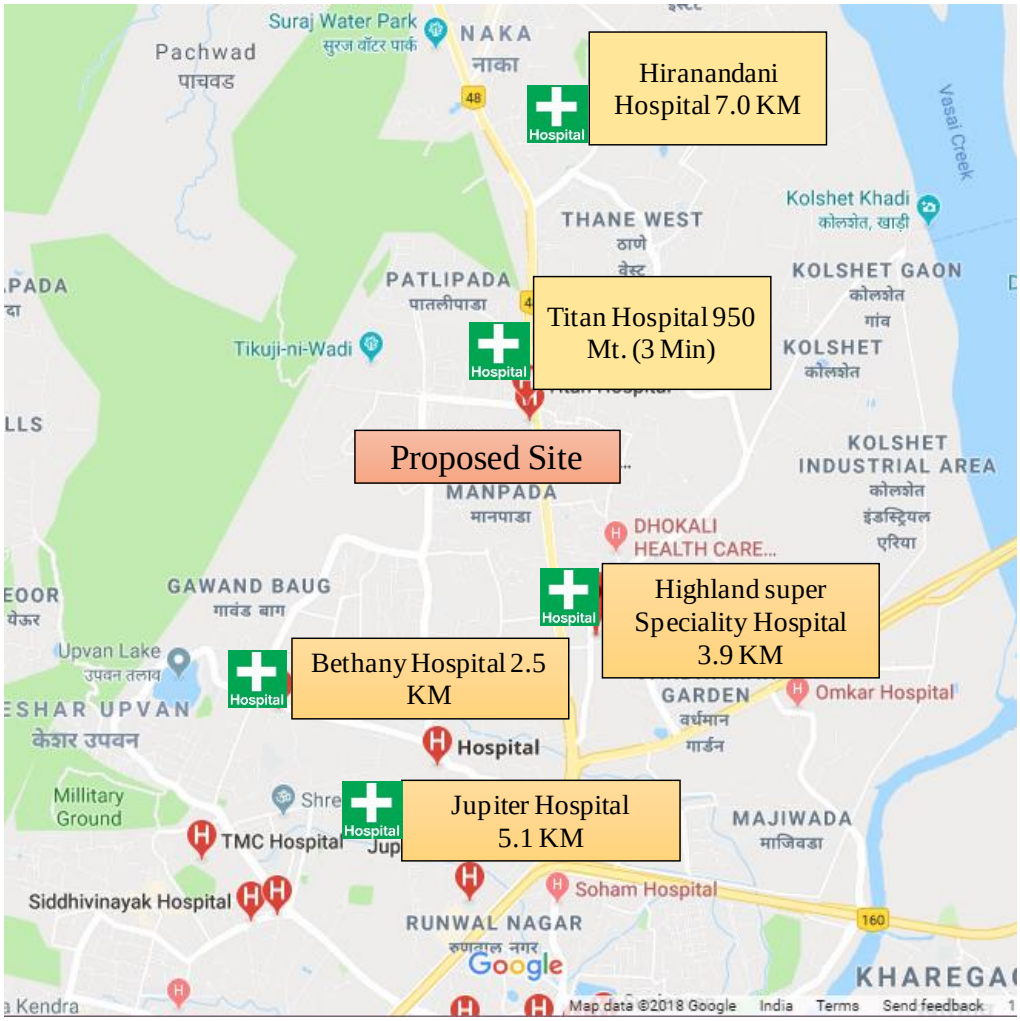


Figure 1.6.1 Location of nearby Hospitals

1.7 Warning System and information sharing

Maharashtra has eight Area Cyclone Warning Centre (ACWC) monitoring stations of IMD. They mainly release special bulletins for cyclone warning. Developer would assist in procuring such information and sharing it with society manager or concerned authority. They would instruct the residents as per the information, without creating any panic situation. In order to share this information some of the communication routes that could be taken are:

a) Direct-to-Home (DTH)

DTH service provides different language channels in the country. The most significant aspect of DTH broadcast is its digital quality, fail-proof communication. Apart from the DTH service of Prasar Bharati (PB), private broadcasters like Dish TV and Tata Sky also provide services on different television channels all over the country. Thus developer would install such kind of booster device on terrace for proper communication for whole communities. They would also install one television set at society office for data updating.

b) Battery-less Hand Radio

Some battery-less, low-cost hand radios are now available in the market which will be useful for receiving warnings. Developer would provide such battery less hand radios to manager for receiving warnings from All India Radio (AIR).

c) Internet

In the present era of electronic communication, internet provides a useful platform for communications. It provides a new and potentially revolutionary option for the rapid, automatic and global dissemination of disaster information. A number of individuals, organizations and groups, including IMD, are using the internet for real time dissemination of weather observations, forecasts, satellite and other data. In the most critical phase of natural disasters, electronic communication has provided the most effective, and in some instances perhaps the only means of communication with the outside world. Developer would provide internet based services at society office and also to all the flats. It would be dependent on flat owners to decide on selecting a particular brand of internet.

All these warning systems would be utilized by the proposed building for acquiring warning data and thus plan adequately for the disasters.

1.8 Road Map of Fire Stations

The proposed project is located at CTS no.160A/1 (pt) & 162(pt) of village Majas Part-1,163 (pt),165 (pt),170 (pt), & 170(c) of village Majas Part -3 at Sarvodaya Nagar Mhada layout, Jogeshwari (East), Mumbai 400 060. The address, phone number, and minimum distance (by road) of nearby Fire stations are given in **Table 1.8.1 & Figure 1.8.1 to 1.8.2**

Table 1.8.1: Details of Fire Stations near proposed project

Sr. No.	Name of Fire Station	Address	Phone Number	Nearest Distance by Road (in Kms.)	Time
1	Balkum Fire Station	Wagle Estate, Opposite Big Bazar, Kapurwadi, Thane West, Thane – 400604	-	1.5	6 min
2	Majiwada Fire Station	Old Agra Road, Sainath Nagar, Majiwada, Thane, Maharashtra 400601	022 2536 6401	2.8	7 min

Note: *The distance given in table is measured from Google earth.

Balkum Fire Station	Majiwada Fire Brigade
	
Figure 1.8.1: Road map from Balkum Fire Station to proposed site.	**Figure 1.8.2: Road map from Majiwda Fire Brigade to proposed site.**
It is about 1.4 km away from the proposed site and would take about 6 mins to reach the proposed site via SMT Gladys. Alternate route via Kherwa Cir Marg & Ghodbandar is about 1.5 Km from proposed site and it will take about 7 mins.	It is about 2.8 km away from the proposed site and would take about 7 mins to reach the proposed site via NH48. Alternate route via Bhiwandi road is about 3.3 Km from proposed site and it will take about 10 mins.

1.9 Do's and Don'ts for Disasters

Do's and Don'ts for Fire

1. Do not panic; keep calm, think and act quickly.
2. Activate the manual fire alarm system provided on the floor to raise alarm.
3. Report to security.
4. Summon the fire brigade on telephone No. 101.
5. Alert the people in the vicinity of fire.
6. Do not take shelter in the toilet.
7. Fight the fire only if you can. Do not take undue risk.

To be displayed at Society Office or at Entrance

Do's and Don'ts for Cyclone

Before the Cyclone season	*When the Cyclone starts*	*Post-cyclone measures*
• Concern authority would inspect the building; secure loose tiles, carry out repair of doors and windows. • Remove dead woods or dying trees; anchor removable objects like lumber piles, loose tin sheds, garbage cans, sign-boards etc. which can fly in strong winds • Emergency light with extra batteries, battery operated torches, battery operated radio and enough dry cells would be kept at society office • Check first aid kit box regularly.	• Listen to the radio for weather warnings. • Pass on the information to others. But one must not to spread rumours. • Believe in the official information. • Developer would be built the proposed building with all the measures to withstand high velocity wind. • Residents would be made aware to switch off electrical mains at emergency situation.	• One must get inoculated against diseases immediately. • Concern authority will clear all the debris from the premises.

Do's and Don'ts for Floods

The concerned authority should take the following measures after receive of flood warning:

- ✓ Closing of sewer wells
- ✓ Torch
- ✓ Batteries
- ✓ Emergency light
- ✓ Acquiring sufficient food material and potable drinking water

Maintenance of First Aid Kit. This First Aid Kit should include disinfectant (Dettol), dressing material, soap, band aid, antiseptic cream, medicines, antibiotics, and scissor

Measures after Floods

- ➢ During floods, incidence of water borne and vector-borne diseases increases. Hence all the staffs and members of the society would be advice to undergo a thorough medical check-up for betterment of their health.
- ➢ All the underground and overhead tanks must be cleaned and disinfected. This must be carried out in presence of qualified staff. Developer would assist in identifying the concern authority or NGO who carried out this kind of activities.
- ➢ The flood affected area must be disinfected. Any water which was stored during floods (in pits, vessels, drums etc.) should be cleaned and disinfected. This would prevent growth and spread of vectors.
- ➢ Desilting and cleaning of storm water channels should be carried out by concerned authority. Developer would assist in carrying out this activity.

Do's and Don'ts for Earthquake

If one is outdoor at the time of earthquake	***If one caught indoors***
➢ If open space is available nearby, go there ➢ Keep away from tall chimneys, buildings, balconies and other projections ➢ Do not run through streets; hoardings or lamps may fall.	➢ Be calm ➢ Stay indoors until the shaking stops ➢ Stay away from glass windows, doors, cupboards etc. ➢ Stay away from falling plaster, bricks or stones ➢ Get under a table so that one does not get hurt by falling objects ➢ Do not rush towards the doors or staircase. They may be broken or jammed ➢ If one goes outside, move quickly away from the building to

	prevent injury from falling debris ➢ Be aware that fire alarm and sprinkler systems frequently go off in buildings during an earthquake, even if there is no fire. Check for and extinguish small fires, and exit via stairs.
Avoid the following in an earthquake	***After an earthquake***
➢ Do not crowd around damaged areas or buildings ➢ Do not waste water. It will be needed for firefighting. ➢ Do not move the seriously hurt people ➢ Wait for medical help to arrive ➢ Do not spread rumors. They lead to panic and worsen the situation	➢ Check if anyone else is hurt. Use first aid at least on the cuts and bruises ➢ Keep the streets clear for emergency services ➢ Switch off all appliances like the refrigerator, TV or Computers ➢ Turn off the gas ➢ A battery operated radio would aid in receiving important messages ➢ Use the stairs, not an elevator ➢ Listen to a portable, battery-operated radio or television for updated emergency information and instructions ➢ Cellular telephone equipment is subject to damage by quakes and cell phones may not be able to get a signal, but regular "land line" phones may work ➢ Open closet and cabinet doors cautiously as contents may have shifted during the shaking and could fall, creating further damage or injury ➢ Watch out for fallen power lines or broken gas lines, and stay out of damaged areas ➢ Stay out of damaged buildings. Damaged buildings may be destroyed by aftershocks following the main quake ➢ Be alert for and observe official warnings ➢ Do not smoke; smoking in confined areas can cause fires.

1.10 Conclusion and Recommendation

- Developer would provide essential information of cyclone and flood warning to society manager or concerned authority.
- Developer would allow setup of mobile boosters for different mobile service provider. Feasibility for the same would be carried out in near future.
- Developer would provide up-to-date building codes to the society manager or the concern authority. National building codes would be made available to the concern authority. These codes identify construction techniques for buildings that help them withstand earthquakes without collapsing and killing people. Also Developer would follow appropriate building codes during construction phase.
- Localize the information by printing the phone numbers of local emergency services offices and hospitals.
- Provide tips on conducting earthquake drills at the proposed site.
- Interview representatives of the gas, electric, and water companies about shutting off utilities.
- Developer would provide 24 x7 water supply.
- All the sensors and fire safety equipment shall be inspected on regular basis by concern authority. If any faulty equipment is found then they must be replaced by developer or they assist in this activity. Society management committee should keep separate funds for DMP.
- All the members and residents would be made familiar with evacuation plan.
- Developer would formulate disaster management cell **(Figure 1.10.1)** and they would be responsible for:
    - Check up and structural auditing of building and submitting the report to manager and TMC on regular basis.
    - First aid kit box, disaster management rescue items, safety training, mock drills, awareness among residents, etc.
    - Training and knowledge dissemination.

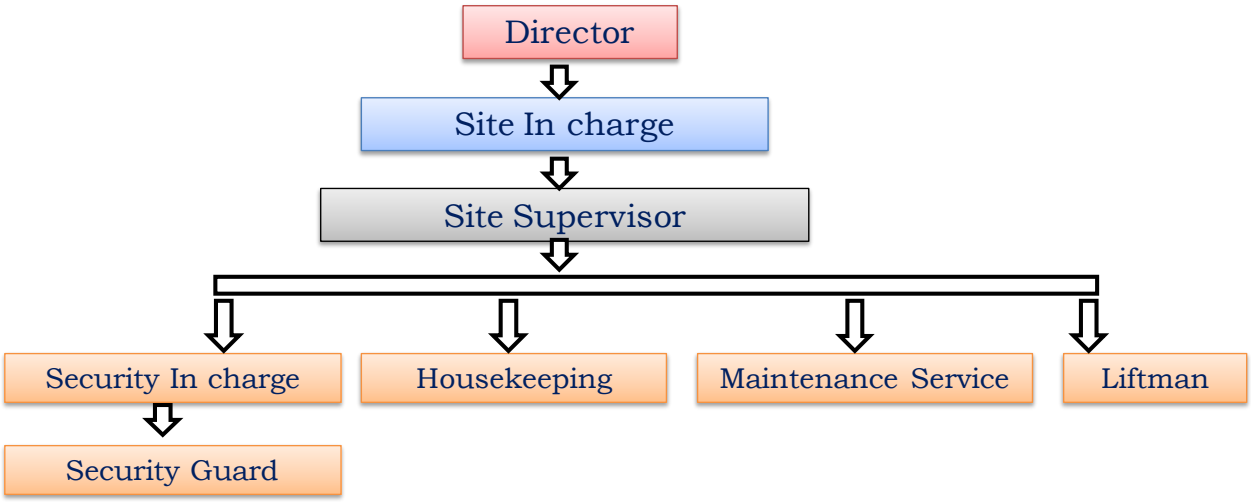


Figure 1.10.1: Disaster Management Cell

Responsibility of Management (Society manager, Secretary and Chairman):

- Society manager would be appointed with background knowledge of environment and safety. This manager would report to secretary and chairman.
- Society manager is to keep all the records like proper functioning of fire alarms, hose reels, first aid kit box, etc. and report the same to Secretary or Chairman on monthly basis.
- Society manager would also be responsible for carrying out mock drills at regular interval as per CFO directives.
- Society manager would also be responsible for maintenance of different signage and cleaning of overhead and underground tanks.
- Cleaning and maintenance of drainage system would be supervised by society manager. Every 3 months, a report for the same to be submitted to chairman or secretary. Before onset of monsoon, society manager or Chairman must evaluate the status of drainage system in order to avoid flooding.
- During disaster, society manage would assist in evacuation of all the residents and supervise the activity in which all the residents are evacuated without creating any panic situation. This kind of drilling activity would be highlighted by society manager during mock drillings.
- Also society manager would coordinate with fire officer and ambulance services during disaster.
- Society manager must ensure all the residents and security personnel attain mock drills

whenever conducted and report the same to chairman or secretary. During mock drill, evacuation plan for each floor must be explained to all the residents.

Security person / Guard

- They must assist society manager in terms of evaluating the details of different various safety equipment like sprinklers, hose reels, etc. If any damages are recorded, the same must be communicated to society manager for immediate action.
- They must attain mock and safety drills arranged by the management.
- During disaster, they must communicate to all the residents via intercom and request them for evacuation. The must supervise the entire evacuation process for each floor.
- They must ensure no one is stuck in the lift during disaster, especially, fire. If anyone gets stuck at fire, then security personnel must communicate the same to society manager for rescue. Once the rescue happens, they must shut down all the lifts.
- During disaster, they must ensure, no one (especially children) get close to the area where any hazardous substances are stored or near sub-station. No one should be allowed to take shelter under the same.
- They must coordinate with ambulance and fire personnel under the supervision of society manager.

Residents

- If any damages are found in terms of functioning of any safety equipment like sprinklers, hose reel, the same must be reported to society manager for immediate action.
- They must attain the mock drills as and when planned by society manager.
- They must ensure proper evacuation without creating any panic situation.
- They must coordinate with society manager for ambulance and fire brigade services.
- In mock drills, residents would be made aware of keeping clean drainage system.
- During mock drills, residents would be made aware about the storage area at the society where hazardous materials is stored, if any. Similarly, power room and sub-station area would be highlighted. They would be advised not to go to those places during disaster, especially fire.

Visitors

- It would be the responsibility of the resident to escort the visitors to a safer area.
- Before entering into the society, visitors would be made aware of exit routes by security

personnel.

Steps to be taken by management during disasters:

Table 1.10.1: Steps for Management during Disaster

Name of Disasters	Steps for Management
Fire	**Before Disasters: Developer Role** • Developer must provide intercom facility at lifts, each flats, corridors, etc. **Before Disasters: Role of Society** • Society manager must audit and maintain different firefighting devices. • If any damages occur, manager must report to chairman and get the problem rectified. Developer would assist in this activity. **During Disaster:** • If fire breaks down, then the personnel, who notice it, must report to society manager or concern authority. One must not spread rumor and be calm. • Society manager must call the fire brigade and hospital, if any casualty. • Manager must switch off the electrical equipment's like corridor lightings, lifts, and inform the same to the residents via intercom. • Manager must ensure evacuation of residents as per evacuation map and ensure all the residents escorted to assembly point without any panic. • One must ensure children and elderly personnel given top priority and safety during evacuation process. • Once the fire brigade arrives, they must take over the entire evacuation process and manager must direct all residents to follow instruction of the fire brigade personnel during the same.
Gas Leak	**Role of Society Manager** • Manager must inspect pipeline and report if any damages to the residence for its replacement. • Manager must keep a record of expiry date of pipes and must ensure that they get replaced before expiry date. • Manager must make the resident aware about reacting during gas leak. **During Gas leak:** • If anybody notice or smell gas leakage, he/she must switch off all the electrical equipment's and open all windows and door for natural ventilation. • He/she must inform about gas leak to the manager for appropriate

	action plan. • One must look for location at which gas leak has occurred. If one unable to find the same, then they must call qualified personnel for the same. Manager must maintain the detail of qualified personnel along with their emergency numbers.
Earthquake	**Role of Developer:** • Must provide building as per proper earthquake resistant codes. • Must ensure structural stability of the building and must procure a structural stability certificate from local Municipality, if possible. **Role of Society:** • Manager must carry out auditing of the building as per local norms and reports the same to the local Municipality. If any damages are occurred or noticed, then it must be reported to chairman for rectification at the earliest. Developer could assist in this activity. • Manager must ensure everyone attains mock drills about earthquake. • Manager must find out warning alarms and notices from IMD or local newspaper or All India Radio. • During earthquake, manager must ensure all the electrical supply is switched off; also ensure proper evacuation without any panic.
Cyclones and Floods	**Role of Developer:** • Must ensure proper storm water drainage and management plan. • Must clean the storm water drainage before monsoon season, even after formation of society, they assist in this activity for proper management of sewerage system near the building. • There will construction of stilt to avoid the flood water to enter in flats **Role of Society:** • Manager must ensure proper cleaning of storm water drainage system during operation phase. • Manager must find out warning alarms and notices from IMD or local newspaper or All India Radio. • Manager must inform all the residents about cyclone and floods and must ensure all residence acquire safety and precautionary measures for the same. • Manager must clean overhead and underground tank with authorized personnel to avoid spread of any diseases. • Manager must keep record of hospitals, and large scale medical store.

Table 1.10.2: Actionable Points for Disaster Management Strategies

Parameters	Actionable Points	Remarks
Preparation of Manual and SOPs to track various disasters	SOP's Do's and Don'ts for various disasters are already prepared by developer.	Information of the same would be spread amongst residence through developers by awareness programs.
Fire Evacuation Plan	Fire Evacuation Plan is already prepared by developer.	It would be displayed at the corridors.
Listing of fire brigades, hospitals, NGOs, Medical store	It is been already prepared and identified by the developer.	It would be displayed at the corridors.
Mock drills	It would be carried out in every 3 months and the report for the same is submitted to CFO and also through compliance monitoring to Environment Department.	Developer would assist in arranging such mock drills in association with Fire Officers.
Structural Audit	It will be carried out by developers on every 6 months.	If any damage is found, it would be rectified by developer at low cost.
Sprinklers and firefighting Equipment	Sprinklers and firefighting Equipment will be installed by developer as per the direction of CFO.	The developer will assist maintenance of the same even after formation of society.
Safety Trainings and Awareness among residents	This will be carried out in every 3 months and report for the same is submitted to CFO.	Developers would assist in this activity.
First Aid Kit Box	It is already listed by the developer.	Developer would assist in maintain the same in near future.
Earthquake Planning	Developer would follow requisite codes for earthquake resistant buildings.	Requisite codes would be followed and provided to the residents for maintaining the same.
Fire Proof Materials	Developer would provide all safety doors and materials two hours of fire rating.	Requisite codes would be followed and provided to the residents for maintaining the same.

Drinking water check up	This will be carried out in every 3 months and report would be submitted to Environment department compliance monitoring.	Developer would assist in this activity during operation phase.
Cleaning of overhead and underground tanks	This will be carried out in every 3 months and report would be submitted to Environment department compliance monitoring.	Developer would assist in this activity during operation phase.
Drainage Check up	It would be carried out in every 6 months; especially once before onset of monsoon season	Developer would assist in this activity and report the same to the drainage department of local municipality.
Air, Water, Noise Assessment	It would be carried out as per EC direction.	Developer would carry out this activity as per EC direction.
Compliance monitoring and reporting	It would be carried out as per EC direction.	Developer would carry out this activity as per EC direction.

1.11 DMP Costing

DMP Costing for Proposed project is Shown in **Table: 1.11.1** And **Table: 1.11.2** for operation phase and construction phase respectively.

Table: 1.11.1 DMP Cost for Operation Phase

Disaster	Component	Cost in Rupees
Flood	Sump Pump for basement	45000
	SWD pipe	375000
Lightening	Lightening Arrester	7684
	Wet riser	5265000
	Hose Reel	307800
	Fire Hydrant System	67500
	Fire Extinguishers	141750
	Fire detection system	230850
	Signages	24300
	Fire Alarm System	475950
	Fire Pump	8000
	Fire tank	35000
	Automatic Sprinklers	52488
Medical Equipment's for emergencies	First aid box	10000
CCTV		990000
PA system		34000
Intercom Facility		420000
D.G.Set		1900000
Man power		80000
Total		**1,04,70,322 (Rs. 1.04 Cr.)**
Operation & Maintenance Cost/Year		**6,28,219 (Rs. 6 Lakhs)**

Table 1.11.2 DMP Cost for Construction Phase

Sr. No.	Description	Cost in Rupees
1	Water Reservoir/Tank	35000
2	Hydrant line & Valve	15200
3	Temporary hydrant Pumps	200000
4	Portable fire extinguishers	9000
5	Fire Buckets	1750
6	Fire Blankets	1750
7	Fire Marshals	17500
8	Train first aiders	40000
9	Stretchers	15000
10	Public address system Mega phone	50000
11	Walky talkie	42500
12	Wheel chair	7500
13	Submersible pumps	90000
14	Diesel pumps	150000
15	Life buoys	2500
16	Temporary pipe arrangement. / Hose pipe	10000
17	CCTV	90000
18	First Aid Kit	3500
19	Lighting Arrestor	3842
20	Signage	7500
21	PPE	40940
22	DMP Personnel	40000
Total		**8,73,482 (Rs. 8 Lakhs)**

1.12 Fire Tender Movement and DG set location

Location of DG set is given in **Figure 1.12.1.**

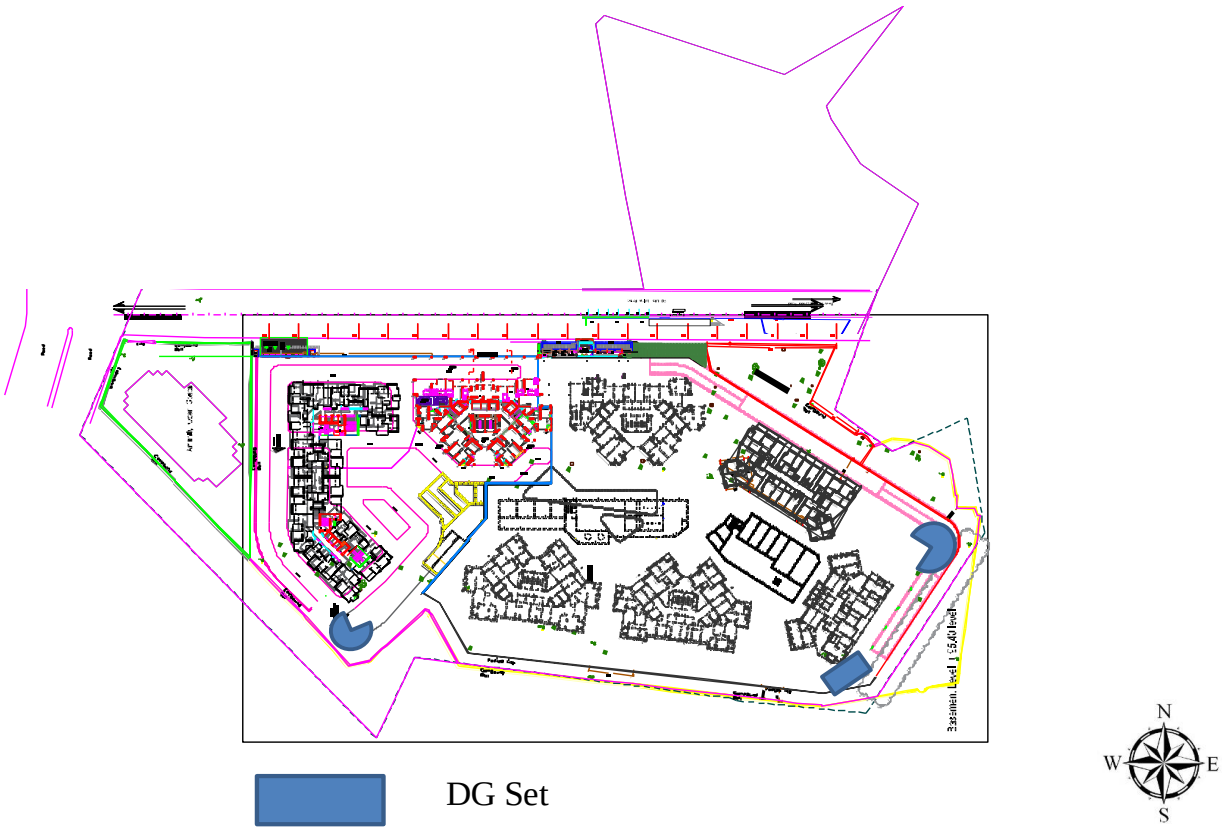


Figure 1.12.1: Location of DG set (Lower Ground Floor)

Fire Tender Movement is given in **Figure 1.12.2**

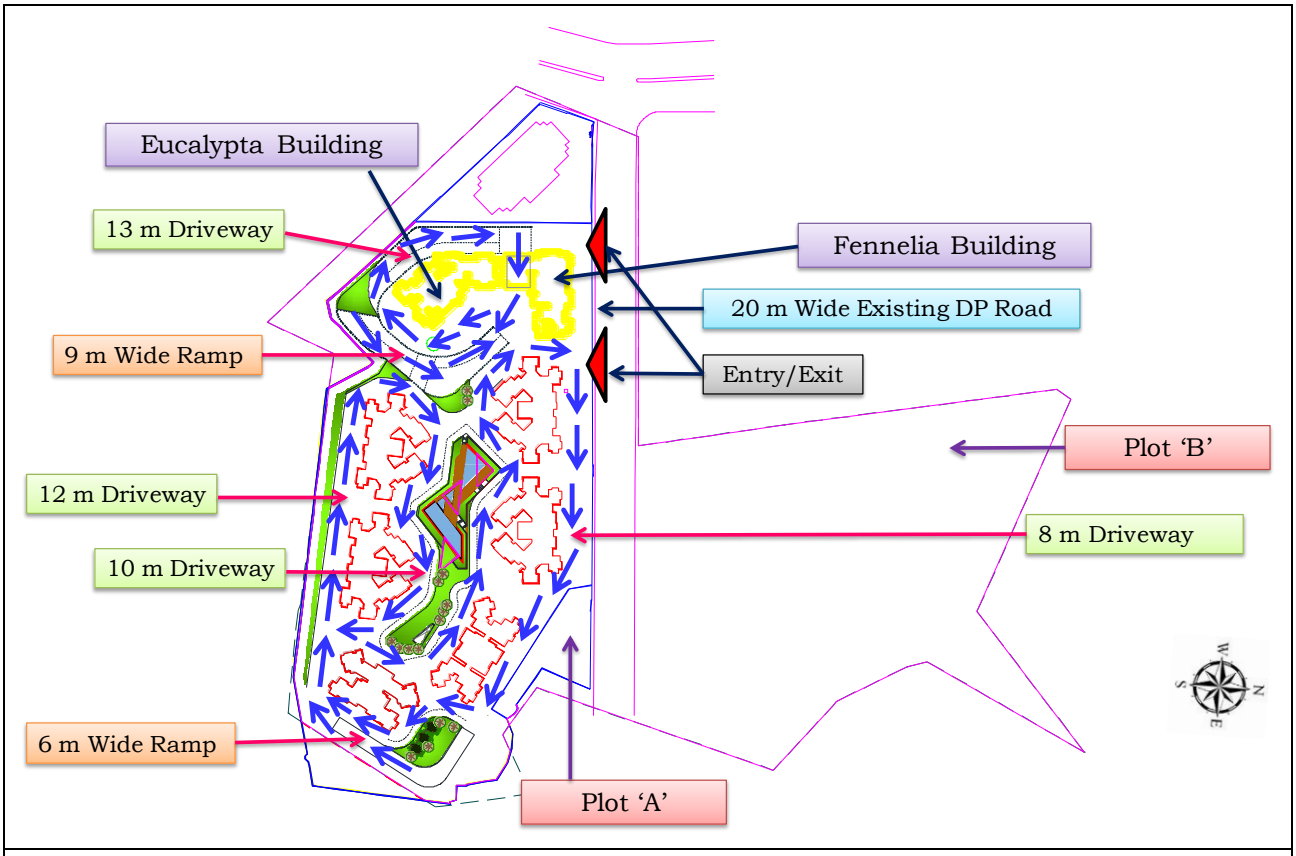


Figure 1.12.2: Fire Tender Movement Plan (Ground Floor)