STANDARD OPERATING PROCEDURES

9.1 S.O.P. for Disaster Management Control

- **On Receiving Warning**
  - Inform Municipal Commissioner, Additional Municipal Commissioners and Deputy Municipal Commissioners**.**
  - Designated officer will take charge of control room operations.
  - Disseminate warning to Ward Control Room.
  - Relay warning to the public through media (TV, FM Radio, SMS, etc.)
- **When Disaster Strikes**
  - Co-ordinate with C. P. Control, Jt. C. P. (Traffic) Control and Fire Brigade for rescue and relief operations.
  - Co-ordinate with Railways for management of disruption of rail traffic, congestion on platforms and evacuation of stranded passengers. Co-ordinate with State Transport authorities for deployment of buses
- **Rescue & Relief Operations**
  - Ploy Search & Rescue teams from the Regional Command of Fire Brigade.
  - Co-ordinate with Home Guards and identified voluntary agencies for providing emergency water and foo d, taking the help of Search &Rescue Team wherever necessary.
  - Co-ordinate evacuation of stranded people to the nearest transitory shelter with the help of volunteers.
  - Co-ordinate with Dy. Municipal Commissioner (Education) for special care of school children according to the contingency plan.
  - Co-ordinate with Jt. Municipal Commissioner (Health) and Executive Health Officer for treatment of the injured and sick.

- Deployment of emergency medical teams where people cannot be immediately shifted.

➢ **Post Disaster Actions**

- Co-ordinate with Police and Health authorities for corpse disposal.
- Co-ordinate with Chief Engineer (Solid Waste Management) for deployment of machinery for disposal of carcasses and removal of debris and garbage.
- Deploy paramedical teams for anti-fly measures and spraying of insecticides.

9.2 SOP FOR FIRE/EXPLOSION

9.2.1 Incident Scenario

Fire/ explosion at the site or in the building towers with potential for damage to property and loss of life.

Mumbai has topped the list among 88 cities in India with and 236 deaths in 2008-12, followed by Delhi with 185 cases and 186 deaths, a report by the National Crime Records Bureau (NC-RB) stated. Among states, Maharashtra (1,095 cases, 820 deaths) stands third after Andhra Pradesh and Gujarat. During that period, 6,700 people died and 947 were injured in the country. Maharashtra recorded an average of over 160 deaths annually, while Mumbai averages 40. Andhra Pradesh recorded 1,394 deaths, Gujarat 1,204 and Maharashtra 820 in that period. Other states recorded half or less deaths than the top three. Mumbai and Delhi topped among cities, followed by Hyderabad (132 cases/136 deaths), Ahmedabad (130/130), Vijayawada (199/122) and Rajkot (77/77). Maharashtra climbed to the second spot with 331 fires in 2011. It witnessed a rise in deaths due to fire caused due to short-circuits in residential and commercial establishments. In 2008, the state recorded 120 deaths; it rose to 131 in 2009 and 152 in 2010. A sharp rise was noticed in 2011, when the toll increased by 263, but it fell to 154 in 2012, the report said.

As per the National Building Code of India, buildings of more than 15 metres height require fire prevention measures, but in Mumbai, as per development control regulations, only buildings of more than 2.4m height require strict fire prevention measures.

9.2.2 Scope

This SOP is applicable for fire incidents on the site;

- Fire of combustibles at the building lower floors
- Fire of combustibles at the building upper floors
- Fire of combustibles at the building above 14th floors
- Vehicle at fire
- PNG/LPG release followed by fire/ explosion
- Diesel release followed by fire/ explosion
- Transformer fire/ explosion

9.2.3 Purpose

The purpose is to localize the emergency, minimize effects of fire, explosion on property and people, effective rescue and medical treatment and safe evacuation.

9.2.4 Impact Zones

Sr. No.	Scenario	Impact Zone
1.1	Fire of combustibles at the building lower floors.	Complete building.
1.2	Fire of combustibles at the building upper floors.	Complete building.
1.3	Fire of combustibles at the building above 14thfloors.	Complete building.
1.4	Vehicle at fire.	Initial evacuation up to 15 m.
1.5	PNG /LPG release followed by fire/ explosion.	Initial evacuation up to 30 m.
1.6	Diesel release followed by fire/ explosion.	Initial evacuation up to 15 m.
1.7	Transformer fire/ explosion.	Initial evacuation up to 15 m.

9.2.5 Emergency response agency

❖ Primary Agency

- Fire and Security Department

❖ Secondary Agencies

- Fire brigade and Police
- The fire services in the Urban Local Bodies (ULB's)

- District Disaster Control Cell
- RITs
- NGOs

9.2.6 Dos and DON'Ts

DO'S

- On noticing fire emergency actuate nearest fire alarm button and/ or inform the Supervisor and follow further instructions and proceed to assembly point.
- Supervisor to inform fire brigade and mobilize firefighting trained persons,
- Cordon off the area, move upwind and evacuate the area.
- Keep the gas cylinder cool with water spray.
- Use AFFF to blanket the oil diesel, spill area. (Aq. Film Forming Foam)
- If there's a lot of smoke, crawl along the floor where the air will be cleanest.

DON'TS

- Do not enter the site unless instructed if you are outside and disaster alarm is heard.
- No smoking
- Avoid use of lift during fire at building.
- Do not panic. Avoid running all over the place prevent others from doing so.

9.2.7 Prevention and Mitigation Activities

- Provision of firefighting equipment.
- Provision of PPE.
- Provision of smoke detectors and Alarm system.
- Water sprinkler.
- CCTV.
- PAS system.

9.2.8 Preparedness activities

- Fire Drill, Mock Drill.
- Prepare back up teams ready for rotation of personnel.
- Keep a torch light and a working transistor radio with spare batteries.
- Display an updated list of emergency telephone numbers.
- Ensure that communication equipment are in working order.

9.2.9 Response activities

- Raising the site emergency alarm.
- Inform police, Fire brigade and Mobilizing site emergency services.
- Determination of level of emergency, help from Advisory team, if required.
- Mobilizing EoC and AP.
- Mobilizing Emergency Respondent teams, IRTs, NGOs.

- Mobilizing resources required for emergency response teams working.
- Coordination between all emergency services.
- Communication with district disaster control cell and declaring off site emergency (if situation escalates).
- Head count at AP and feed back to SAR team.
- SAR and Evacuation.
- SOP implementation by the emergency response teams.
- Traffic control, law and order situation and crowd control.
- Release of authorized information to the media.
- Emergency under control report to CSC.
- Termination of emergency and All clear alarm.

9.2.10 Life saving measures

- In case cloth on fire lie on ground and cover in blanket.
- Pour water on burn for at least for 10 minutes.
- Avoid breaking the burn blisters on skin and removing pieces of burnt cloth.
- Remove tight items such as watch, bracelet, and ring before swelling occurs.

9.2.11 Recovery activities

- Get the de-warning from chief site controller and announce the same
- Information centres will be set up to provide response information to the public, relatives of victims and media
- Replenishment of used stocks of fire fighting materials
- Follow up of injured at hospital.
- Setting up help desk
- Record keeping
- Clean and rehabilitate the disaster site.
- If people are buried under the debris, call for help of the rescue teams and render your help.
- Determine priorities for restoration work and seek the advice of a conservator as to the best methods and options, and obtain cost estimates.
- Contact insurers.

- Analyse the disaster and improve the plan in the light of experience.

9.2.12 Resource requirements

ADDITIONAL RESOURCES

- Portable Fire extinguishers.
- PPE, SCBA, Fire suit.
- Search and rescue equipment – Ropes, ladders, Search light.
- Combustible gas, CO and Oxygen detector.
- PAS and Two way radio.
- Lightening arrestor scheme
- Fire glass break alarm system
- Smoke detectors
- PAS system

9.2.13 Terms and Definitions

Fire: A process of combustion characterized by heat or smoke or flame or any combination of these. Hazard - any situation that has fire potential.

Explosion: A sudden release of energy characterized by accompaniment of a blast wave.

Smoke: Smoke is defined as a mixture of hot vapours and gases produced by the combustion process along with unburned decomposition, condensation matter and the quantity of air that is entrained or otherwise mixed in to the air

9.2.14 Revision/ rehearsal/ drill/ history

Sr. No.	Date Of Revision/updating	Revision No.	Reason For Revision
1.	XXX.	0	Nil, First edition.

9.3 SOP FOR BOMB THREAT, SUSPECT MAIL/ PARCEL

9.3.1 Incident scenario

1. Bomb threat; Hoax message. Genuine message.

2. Letter bomb.
3. Pocket/ parcel/ book bomb.

9.3.2 Scope

This SOP is applicable for the bomb threat at site. The threat may be in different forms such as letter bomb, parcel bomb, book bomb, car bomb, human bomb etc.

9.3.3 Purpose

The purpose is to localize the emergency, minimize effects of bomb threat/ explosion on property and people, effective search, rescue and systematic evacuation to safe location from the vulnerable zone.

9.3.4 Impact Zones

Bomb Threat Evacuation Guide

THREAT	DESCRIPTION	EXPLOSIVE QTY	MIN[1] (m)	MAX[2] (m)
	Pipe Bomb Small	100g	80	575
	Pipe Bomb Medium	500g	100	860
	Pipe Bomb Large	2.5kg	130	1,135
	Briefcase/Suitcase	23kg	185	1,520
	Compact Sedan	230kg	270	1,915

Note:

- Min. withdrawal distance is intended for use by essential personnel with adequate frontal and overhead protection.
- Maximum evacuation distance is governed by the greater of the throw distance for fragmentation or the glass breakage/falling hazard distance.
- Radio or mobile phone transmissions: min. of 25 m from the device is recommended as the safe distance for transmissions.
- A bomb causes damage both by blast effect and by missiles which it scatters on explosion. Missiles effect extends over a fairly wide area. Blast effect is proportional to the explosively small area but affects everything within that area.

- Due to small size, and hence small quantity of explosive charge, homemade bombs do too cause much damage beyond 3-4 meters by blast effect. The missile effect of homemade bombs of common type may not extend beyond 10 meters of the point of explosion. Blast and missile effect of a large homemade bomb would extend over a much wider area.
- Car bomb /human bomb /Time bomb: The timing device is usually concealed in the bomb. It is rarely possible to identify a Time Bomb or to ascertain the set time. There is therefore a measure of risk in dealing with a Time Bomb.
- Letter bomb: Normally letter bombs contain a charge of explosive, usually a high explosive and a suitable initiating device. The fundamental principle is that about 60 g of high explosive can, or explosion, cause fatal injuries to a man with 60 cm.
- If approximate size of bomb is known use this information as guide to provide safe minimum distance for evacuation.

9.3.5 Emergency response agency

❖ PRIMARY AGENCY

- Fire and security Department

❖ SECONDARY AGENCIES

- Police Bomb Detection & Disposal Squad (BDDS).
- Fire brigade and Police.
- The fire services in the Urban Local Bodies (ULB's).
- District Disaster Control Cell.
- RIT's.
- NGO's.

9.3.6 Dos and DON'Ts

DOs

- Cordon off the area.
- Evacuate the area

- Be careful about entering into a room in which or seat which an explosion has occurred to bring you there. It may be used to trap you.
- Examine carefully without moving or tilting the suspected object, its shape, size construction, finish, marking and special features, if any. Note these particulars down. Try to identify it ascertain whether the object has been moved or handled before you saw it.
- Consideration should be given to suspicious vehicles/packages at the EoC and Assembly points also.
- Follow the rule **"DO NOT TAKE THE BOMB AWAY FROM THE PUBLIC.TAKE THE PEOPLE AWAY FROM THE BOMB".**

DON'Ts

- Do not panic.
- Do not open a closed room/ door/ window/ cupboard/ box in the normal way tap wood cover and open with a ling pole or in any other improvised manner.
- Do not switch on any electric line, if the room is dark. Use hand torch for illumination.
- Do not touch, lift, drag kick, hit or move the suspected object, examine room or place quickly to see, if there is any wire or string held taut, any loose pair of insulated wires connected door/ window/ cupboard/ box or any lighted fuse or lighted rope if so.

9.3.7 Prevention and Mitigation Activities

- CCTV
- PAS System

9.3.8 Preparedness activities

- Mock drill for evacuation.
- Training; Learn about causes and effects. Speak about them in a calm and composed manner.
- Awareness program - Posters, boards. Prepare back up teams ready for rotation of personnel. Ensure that communication equipment are in working order.

9.3.9 Response activities

EVACUATION

Response to Bomb Threat Call

- Emergency coordinator to take over the communication.
- During the conversation with the bomb threat caller, the receiver of the call should observe for certain other information like way that the employees do not panic and get confused.
- It will be very difficult to control the employees, if they run for their life in panic and confusion.
- The announcer should keep his calm and should not show any anxiety.
- He should specify the evacuation route more clearly, details of guides who will guide the employees to the safer area and the location of assembly area.
- He should also state the importance of remaining in the assembly area till further instruction.

Evacuation

- Use Siren, PAS and Walkie-Talkie sets to intimate the site personnel in the affected area for evacuation.
- Evacuate the personnel to refuge area and to assembly point as the case requirement, verify head count at assembly point.
- Mobilize AP and head count event.

Precautions – DOs AND DON'Ts

- Remain calm
- Walk out of the building quietly and orderly manner
- Follow the evacuation route only
- Follow instruction from guides on any confusion about the route and assembly area.
- Switch off the machinery and power supply before leaving the area.
- Help ladies and old people to safe area.
- Remain in the assembly area until further instructions are given.
- Check for all the employees at the assembly area. If anybody is missing, the matter should be immediately reported to the co-ordinator of Bomb Threat Committee.

- Do not run. Walk calmly
- Do not argue or try to obtain details about the bomb from anybody leading to time loss.
- Do not obstruct the flow of evacuation.
- Do not leave any personal belongings
- Do not obstruct passage to anybody.
- Do not make noise at the assembly area.
- Do not spread rumours.

9.3.10 Life saving measures

Quickly take shelter/ fall on floor and protect head with both hands.

9.3.11 Recovery activities

- Establish a program to restore both the disaster site and the damaged materials to a stable and usable condition.
- Determine priorities for restoration work and seek the advice of a conservator as to the best methods and options, and obtain cost estimates.
- Contact insurers.
- Analyse the disaster and improve the plan in the light of experience.

9.3.12 Resource requirements

BOMB DISPOSAL

- Strong, smooth string of well twisted cotton yarn or plastic yarn.
- Long pole.
- A bucket or tin can with its top open.
- A sharp knife or a pair of scissors.

FIRE FIGHTING EQUIPMENTS

- Fire hydrant system (Refer Annexure No. 1).
- Water sprinkler system.
- Portable Fire extinguishers.
- PPE, SCBA, Fire suit.

SEARCH AND RESCUE EQUIPMENT

- Ropes, ladders.
- Portable flood lights, Search light.
- Combustible gas, CO and Oxygen detector.
- Cutting set.

SPECIALIZED HEAVY EARTHMOVING EQUIPMENT

- JCB.
- Dumper.
- Crane.

9.3.13 Terms and Definitions

Bomb

A device or any size or shape, which can look obvious or be camouflaged, may vary in its sophistication, and may not necessarily explode (i.e incendiaries, toxic/noxious substances, sharps, animals/reptiles). May be referred to as an Improvised Explosive Device (IED).

Bomb Threat

A threat, written or verbal, delivered by electronic, oral or other medium, threatening to place or uses an explosive, chemical, biological or radiological device at a time, date, and place or against a specific person or organization. It is not necessary for any other action to be taken by the offender.

9.3.14 Revision/rehearsal/drill/history

Sr. No.	Date of Revision/updating	Revision No.	Reason For Revision
1.	XXX.	0	Nil, First edition.

9.4 SOP FOR EVACUATION

9.4.1 Incident Scenario

Safe evacuation of the site during emergency to assembly point.

9.4.2 Scope

This procedure describes the process to prepare for and safely evacuate during an emergency such as fire, explosion, bomb threat, chemical spill, personal threat, and injury etc. including drills that may be conducted in preparation of this.

This procedure applies to all:

- Management
- Project participants
- Employees
- Sub-contractors
- Visitors.

9.4.3 Purpose

The purpose is systematic safe evacuation of all persons away from the vulnerable zone to safe place.

9.4.4 Impact zones

Sr. No.	SCENARIO	IMPACT ZONE
1.	Overcrowding/ stampede.	Escape route to Assembly point.

9.4.5 Emergency response agency

❖ Primary Agency

- Fire and security Department

❖ Secondary Agencies

- Fire brigade and police.
- The fire services in the Urban Local Bodies (ULBs).
- District Disaster Control Cell.
- RITs.

TABLE: ASSEMBLY POINT		
Emergency	**Construction**	**Operational Phase**
Level 1	Site Office	At Assembly Points
Level 2	Near Site Office	At Assembly Points
Level 3	Near Site Office	At Assembly Points

9.4.6 Dos and DON'Ts

PRECAUTIONS – DO'S AND DON'TS

- Remain calm.
- Walk out of the building quietly and orderly manner.
- Follow the evacuation route only.
- Follow instruction from guides on any confusion about the route and assembly area.
- Switch off the machinery and power supply before leaving the area.
- Help ladies and old people to safe area.
- Remain in the assembly area until further instructions are given.
- Check for all the employees at the assembly area. If anybody is missing, the matter should be immediately reported to the co-ordinator of Bomb Threat Committee.
- Do not run. Walk calmly.
- Do not argue or try to obtain details about the bomb from anybody leading to time loss.
- Do not obstruct the flow of evacuation.
- Do not leave any personal belongings.
- Do not obstruct passage to anybody.
- Do not make noise at the assembly area.
- Do not spread rumours.

- Use staircase during evacuation and avoid lift as power may fail.

9.4.7 Prevention and Mitigation Activities

- CCTV
- PAS System

9.4.8 Preparedness Activities

- Evacuation drill.
- Training;
- Learn about causes and effects.
- Speak about them in a calm and composed manner.
- Evacuation signs & diagrams are included in each relevant area.
- Evacuation diagrams.
- Prepare back up teams ready for rotation of personnel.
- Keep a torch light and a working transistor radio with spare batteries.

9.4.9 Response Activities

- Ensure the safe evacuation of all occupants from the building.
- Account for all occupants at the assembly area.
- Ensure occupants do not attempt to re-enter the building until it is safe to do so.
- Alert all occupants without further compromising life and assist those which are persons with special needs.

Evacuation of Alternatively-Abled Persons

In the event of an emergency it is important that those persons with a disability or a condition that may cause them to make it safely to an assembly point are appropriately catered for. This can be achieved in the following way:

- SAR team members have training in assisting persons that are disabled
- Information identifying PEEP's (Personal Emergency Evacuation Plan) Maintained at EoC.
- Provision of an evacuation chair.

9.4.10 Life Saving Measures

FIRE SAFETY PLAN

- Individual floor layouts
- Population of floors
- Number and kind of exits
- Zoning of the floor by area and occupants
- Refuge floors and area
- Evacuation diagram
- Assembly point
- Site surroundings map

Recovery Activities

- Guide the search and rescue team with geographic information and persons trapped.
- Setting up help desk.
- Record keeping.
- Replenish depleted resources.
- Check for injuries and first treat yourself, then help others. Follow up with injured at hospital.

GETTING BACK TO NORMAL

- Analyse the disaster and improve the plan in the light of experience.

9.4.11 Resource Requirements

- PPE, SCBA, Fire suit.
- Ropes, ladders.
- Portable flood lights, Search light.
- Combustible gas, CO and Oxygen detector.
- Cutting set.
- Specialized heavy earthmoving equipment.

9.4.12 Terms and Definitions

EVACUATION:

The orderly movement of people from a place of danger.

EMERGENCY RESPONSE TEAM (ERT):

Specialist or specially trained personnel to attend to specific incidents to contain control or eliminate the emergency using emergency response equipment. The ERT may be in place longer than the ECO which is primarily focused around evacuation.

REFUGE:

An area on a floor or area that is specifically designed to protect people from heat, smoke and toxic gases and which provides direct access to an exit.

PHYSICALLY CHALLENGED PERSON:

The official definition of a disabled person, while helpful in determining who should have a PEEP, may not cover the full range of personnel for whom effective evacuation may be compromised. Obese personnel and those with an illness or injury that is not chronic or permanent may also need assistance in the event of an emergency. Consideration must be given in times of emergency as to the additional resource required to handle both known PEEP holders and persons for whom effective evacuation may prove problematic.

PERSONAL EMERGENCY EVACUATION PLAN (PEEP):

An individualized emergency plan designed for an occupant with a disability who may need assistance during an emergency.

VISITOR:

A person who is within a facility who is temporarily visiting the facility and is not employed at or for the facility, either on a permanent, casual, temporary, contracting basis, a resident or inmate or studying at the facility. Visitor implies that the person has not received an induction to the Precinct.

9.4.13 Revision /Rehearsal /Drill /History

Sr. No.	Date Of Revision/updating	Revision No.	Reason For Revision
1.	XXX.	0	Nil, First edition.

Evacuation drill will be held at least annually and will be planned in the training schedule. Record of the drill to be maintained by fire and security department. All staff is trained assuming each role as necessary. Recognizing that infrequent performance in the role will result in knowledge decay an awareness of duties specific to each role is insisted during training program.

9.5 SOP FOR CYCLONE

9.5.1 Incident Scenario

The cyclone passing over the site as a result there is potential for property damage and loss of life. The strong cyclonic winds circulate in anti-clockwise direction in the Northern Hemisphere Tropical storms are intense low pressure areas from the centre of which pressure increases outwards- The amount of the pressure drop in the centre and the rate at which it increases outwards gives the intensity to these storms and the strength of winds.

Table 9.1 Classification of Cyclonic Wind Speeds.

Sr. No.	Types of Disturbances	Associated Wind Speed in the Circulation
1.	Low Pressure Area.	Less Than 17 Knots (<31 kmph).
2.	Depression.	17 To 27 Knots (31 To 49 kmph).
3.	Deep Depression.	28 To 33 Knots (50 To 61 kmph).
4.	Cyclonic Storm.	34 To 47 Knots (62 To 88 kmph).
5.	Severe Cyclonic Storm.	48 To 63 Knots (80 To 118 kmph).
6.	Very Severe Cyclonic Storm.	64 To 119 Knots (119 To 221 kmph).
7.	Super Cyclonic Storm.	120 Knots and above. (222 kmph& above).

(Based on World Meteorological Organization Classification).

9.5.2 Scope

This SOP is applicable for the site Cyclone incidents.

9.5.3 Purpose

The purpose is to minimize effects of cyclone hazards on property and people, effective rescue and medical treatment and systematic evacuation to safe location if required.

9.5.4 Impact Zones

Sr. No.	Scenario	Impact Zone
1.	Cyclone.	Depends of intensity of cyclone.
2.	After effect fires.	Refer SoP No. 3.
3.	After effect flood.	Not anticipated at site.

Table 9.2 Major Cyclone in Mumbai

Name	Year
Greater Bombay Cyclone	1882 (Death 100000)
Indian Tropical Cyclone	2001
Cyclone Gonu	2007
Phyan	2009
Jal	2010

Pre and Post-monsoon storms are more violent than the storms of the monsoon season. Life span of a severe cyclonic storm in the Indian seas averages about 4 days from the time it forms until the time it enters the land.

9.5.5 Emergency Response Agency

Primary Agency

- Fire and security Department

Secondary Agencies

- Fire brigade and police.
- The fire services in the Urban Local Bodies (ULB's).
- District Disaster Control Cell.
- RITs.
- NGOs.

9.5.6 Dos and DON'Ts

BEFORE THE CYCLONE SEASON

- Check your building and roof are in good condition.
- Trim tree branches well clear of your house.
- Clear property of loose material that could cause injury and damage during extreme winds.

UPON A CYCLONE WARNING

- Don't ignore warnings and don't go sightseeing.
- Listen to local radio/TV for further information.

ON WARNING OF LOCAL EVACUATION

- Heed warnings and follow advice given.

WHEN THE CYCLONE STRIKES

- Disconnect all electrical appliances.
- Stay inside and shelter well-clear of windows.
- Listen to your radio for cyclone updates.
- Beware the calm 'eye'. Don't assume the cyclone is over if a calm period is due to the 'eye', violent winds will soon resume from the opposite direction.
- If driving, stop - clear of trees, power lines and streams.
- If in a public building, get away from glass.

AFTER THE CYCLONE

- Don't go outside until advised officially that it is safe.
- Listen to local radio for official warnings and advice.
- If you had to evacuate, don't go home until advised. Use route recommended and stay calm.
- Don't make unnecessary telephone calls.

- Beware of fallen power lines, damaged buildings and trees, and flooded water courses.

9.5.7 Prevention and Mitigation Measures

- Provision of fire fighting equipment.
- Provision of PPE.
- Provision of smoke detectors and Alarm system.
- Water sprinkler.
- CCTV.
- PAS system.

9.5.8 Preparedness Activities

- Fire drill, mock drill.
- Training; Learn about causes and effects. Speak about them in a calm and composed manner
- Awareness program – Posters, boards.
- Prepare back up teams ready for rotation of personnel.
- Keep a torch light and a working transistor radio with spare batteries.

9.5.9 Response Activities

- Raising the site emergency alarm
- Inform police, Fire brigade and Mobilizing site emergency services
- Determination of level of emergency, help from Advisory team if required
- Mobilizing EoC and AP
- Mobilizing Emergency Respondent teams, IRT's, NGO's.
- Mobilizing resources required for emergency response teams working
- Co -ordination between all emergency services
- Communication with District Disaster Control Cell and declaring off site emergency (if situation escalates).
- Head count at AP and feed back to SAR team
- SAR and Evacuation
- SOP implementation by the emergency response teams

- Traffic control, law and order situation and crowd control.
- Release of authorized information to the media.
- Emergency under control report to CSC.
- Termination of emergency and 'All Clear Alarm'.

9.5.10 Life Saving Measures

Hitting flying objects can be fatal, avoid moving in open during cyclone.

9.5.11 Recovery Activities

- Get the de-warning from District Control Room and announce the same
- Give immediate assessment to the authority on damage, massive casualty etc
- Guide the search and rescue team with geographic information and high damage
- Setting up help desk
- Record keeping
- Replenish depleted resources
- Keep calm, switch on the transistor radio and obey any instructions you hear on the radio.
- Check for injuries and first treat yourself, then help others. Follow up with injured at hospital
- If there is a fire try to put it out with help of people around you.
- Clean and rehabilitate the disaster site.
- If people are buried under the debris, call for help of the rescue teams and render your help.

9.5.12 Resource Requirements

Firefighting equipment

- Fire hydrant system (Refer Annexure No. 1)
- Water sprinkler system.
- Portable Fire extinguishers.
- PPE, SCBA, Fire suit.

Search and rescue equipment

- Ropes, ladders.

- Portable flood lights, Search light.
- Combustible gas, CO and Oxygen detector.
- Cutting set.

Specialized heavy earthmoving equipment

- JCB.
- Dumper.
- Crane.

9.5.13 Terms and Definitions

Cyclone: A weather system consisting of an area of low pressure, in which winds circulate at speeds exceeding 61 km/h, also known as 'Cyclone' or Tropical Storm. These are non-frontal synoptic scale weather systems originating over tropical waters with organized convention and definite cyclonic surface wind circulation. Winds rotate around the low pressure centre in an anti-clockwise direction in the Northern Hemisphere and in a clockwise direction in the Southern Hemisphere.

Depression (low pressure area): Region where the barometric pressure is lower relative to that in the surrounding regions at the same level and wind speed in circulation is between 17 and 27 knot (31 and 49 km/h).

Doppler radar: A radar capable of measuring the change in frequency of a radar wave caused by the relative motion of an object in the atmosphere within the area of radar coverage.

Evacuation: Organized, phased and supervised dispersal of people from dangerous or potentially dangerous areas.

Eye of the Cyclone: A term used for the centre of a cyclone. It is the point where the wind rotates in a counter-clockwise direction. In the centre of eye the wind is calm or slight and rainfall and cloudiness is nil or light.

Gale: Wind with a speed between 34 and 40 knots (Beaufort scale wind force 8).

Knot: A knot is a unit of speed and used around the world for maritime and aviation purposes. 1 international knot = 1 nautical mile per hour = 1.852 kilometres per hour.

Landfall: A point on the land where a cyclone just crosses the coast.

9.5.14 Revision/ Rehearsal/ Drill/ History

Sr. No.	Date Of Revision/updating	Revision No.	Reason For Revision
1.	XXX	0	Nil, First edition.

9.6 SOP FOR EARTHQUAKE

9.6.1 Incident Scenario

An earthquake is a violent shaking of the earth's crust due to breaking and shifting of rock beneath the earth surface. Earthquake is a common form of natural disaster which can take place any moment and at any place without any warning and can bring any scale of damage. There may be such locations which are distant, isolated and difficult to reach. There may also be a situation when simultaneously different types of incidents occur requiring different specialized handling. For example while a building may have collapsed in case of earthquake, short circuits, gas leaks (PNG lines if provided) may also have occurred resulting in fire at a number of places. In case of earth quake there is very little or virtually no time for evacuation and to take preventive measures for occurrence of such disaster.

9.6.2 Scope

This SOP is applicable for the site earth quake incidents.

9.6.3 Purpose

The purpose is to effective search and rescue of the earth quake affected location, medical treatment to injured and safe evacuation of people to safe location.

9.6.4 Impact zones

Sr.No.	Scenario	Impact Zone
1.	Earthquake.	Depends of intensity of earth quake.
2.	After effect fires.	Refer SoP No. 3.
3.	After effect flood.	Not anticipated at site.

9.6.5 Emergency response agency

Primary Agency

- Fire and security Department

Secondary Agencies

- Fire brigade and Police.
- The fire services in the Urban Local Bodies (ULB's).
- District Disaster Control Cell.
- RITs.
- NGOs.

9.6.6 Dos and DON'Ts

DURING AN EARTHQUAKE

- Keep calm and keep others calm Practice Drop, Cover and Hold.
- Keep away from buildings, especially old, tall buildings or detached buildings, electricity wires and poles, slopes and walls. They are liable to collapse.
- Do not panic. Remain calm and self-assured and help others who are distressed.
- DO NOT use the elevators.
- Do not turn on switches if you have electric connection in your place. Use your torch
- Do not touch any metal object in contact with loose, hanging electric wires.
- Do not go near damaged structures or ender badly damaged buildings
- Do not go sightseeing or wandering in the streets aimlessly to see what is happening around.
- Keep the roads clear for the movement of relief and rescue teams.
- Do not spread rumours.

INDOORS:

- Take cover under a sturdy desk, table, or bench or against an inside wall, and hold on. If there isn't a table or desk near you, cover your face and head with your arms and crouch in an inside corner of the building.
- Do not rush to the doors or the exits and keep well away from windows, mirrors and furniture.

- Stay away from glass, windows, outside doors and walls, and anything that could fall, such as lighting fixtures or furniture.
- Stay in bed—if you are there when the earthquake strikes—hold on and protect your head with a pillow, unless you are under a heavy light fixture that could fall.
- In that case, move to the nearest safe place.
- Let younger children, elderly and disabled people leave first.

Use a doorway for shelter only if it is in close proximity to you and if you know it is a strongly supported, load bearing doorway.
Stay inside until the shaking stops and it is safe to go outside. Most injuries during earthquakes occur when people are hit by falling objects when entering into or exiting from buildings.
Be aware that the electricity may go out or the sprinkler systems or fire alarms may turn on.

OUTDOORS

- Stay there if safe.
- Move away from buildings, streetlights, and utility wires.
- Do not run and do not wander in the street or on the roads for sightseeing. Walk towards an open place, in a calm and composed manner.
- You must keep the roads free for movement of rescue and relief teams

IN A MOVING VEHICLE

- Move to side of the road and stop. Stop as quickly as safety permits and stay in the vehicle. Avoid stopping near or under buildings, trees, overpasses, and utility wires.
- Proceed cautiously once the earthquake has stopped, watching for road and bridge damage

TRAPPED UNDER DEBRIS

- Do not light a match.
- Do not move about or kick up dust.
- Cover your mouth with a handkerchief or clothing.

- Tap on a pipe or wall so rescuers can locate you. Use a whistle if one is available.
- Shout only as a last resort—shouting can cause you to inhale dangerous amounts of dust.

9.6.7 Prevention and Mitigation Measures

- Provision of fire fighting equipment.
- Provision of PPE.
- Provision of smoke detectors and Alarm system.
- Water sprinkler.
- CCTV.
- PAS System.

9.6.8 Preparedness Activities

- Fire drill, mock drill.
- Training; Learn about causes and effects. Speak about them in a calm and composed manner
- Awareness program - Posters, boards.
- Prepare back up teams ready for rotation of personnel.
- Keep a torch light and a working transistor radio with spare batteries.
- Keep an updated list of telephone numbers like Doctor, Fire, Police and District Administration, Ambulance, water, electricity, etc and all your family members should know them.
- Arrange your place in such a manner that it is easy to move around.
- Attach shelves, gas cylinders, flower pots etc., to the walls of the room.
- Place heavy objects on the floor or in lower shelves
- Teach all members of your family how to turn off electricity and gas supply
- Ensure that communication equipment are in working order

9.6.9 Response Activities

Earthquake assumption worst possible scenario.

TIME FRAME 0 TO 15 MINUTES
Earth quake noticed manually or detected on equipment/ sensor fire department to activate at site alarm from control room.
Site controller to inform the chief site controller and activate DMP Activate emergency services for firefighting (if any), the search and rescue teams in the affected areas with immediate effect.
Inform police, Fire brigade and Mobilizing site emergency services.
TIME FRAME 0 TO 30 MINUTES
Chief Site controller to analyse the available initial information on damage and needs. Verify the authentic of the incident and take decision on the level of the disaster, inform District Disaster Control Cell and mobilize external support agencies.
Emergency Co-ordinator to Mobilizing EoC if not affected or alternate EoC if required and feasible; Assembly point and head count.
Site controller to activate first aiders to provide first aid to affected and arranges to shift injured people to hospital if required. Emergency Coordinator to ensure appropriate mobilization of medical services from external agencies.
TIME FRAME 0 TO 3 HRS
Site controller to activate Maintenance team to re-establish communication links and restoration of critical utility services like water for fire fighting, restoration of access roads.
Emergency Coordinator to Mobilize emergency response teams, coordinate with District disaster cell for IRT's. NGO's help and establish media management/ guidance to volunteers and aid agencies and for rumour control.
Provide additional security in affected areas and maintain law and order situation.
TIME FRAME 0 TO 24 HRS
Restore essential services i.e. power, water supply, communication Facilities etc. on priority basis.
Develop situation report of the affected areas and share with all Stakeholders.
Set-up an information centre/ help desk for identification.

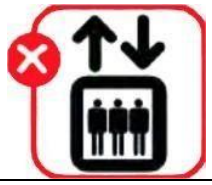
NOTE: EXPECT EARTHQUAKE AFTER SHOCKS

- While Evacuation keep clear of buildings and glass in particular. Point key will be roll calls so rescue team knows where to concentrate their efforts in the event of building collapse.
- In the event of the quake ceasing and no visible damage be aware of aftershocks.
- Re-occupy when safe to do so.
- Be aware that items, especially those stored overhead may well have become dislodged.

9.6.10 Life Saving Measures

1. During Earthquake drop to the floor, take cover under a study desk or table and hold on to it so that it do not move away from you Wait there until the shaking stops.

2. **Escape when you are inside building.**

	
If you are in structurally sound building stay there.	If you are inside an old weak structurally take the fastest and safest way out.
	
Do not use elevators. After the shaking stops, take the staircase to reach open space.	

3. **When you are outside building.**

	
If you are not next to an exit and situated in high rise building/ upstairs stay inside, do not panic, keep calm and take necessary action.	If you are near an exit, leave the building as soon as possible, do not rush to the exit point, get out calmly and orderly manner.


Move away from power lines, posts, walls, false ceiling, parapet, falling flower pots and other elements that may fall or collapse. Stay away from building with glass panes.

4. When on the road.

	
If you are near hillside, move away –in case land slide or falling rocks.	While driving vehicle pull to the side of the road and stop. Do not attempt to cross bridges / flyovers which may have been damaged.

9.6.11 Recovery Activities

- Get the de-warning from District Control Room and announce the same
- Disseminate precautionary information on post disaster health hazards and remedies
- Give immediate assessment to the authority on damage, massive casualty etc
- Guide the search and rescue team with geographic information and high damage
- Setting up help desk
- Record keeping
- Replenish depleted resources
- Keep calm, switch on the transistor radio and obey any instructions you hear on the radio.
- Expect after shocks
- Check for injuries and first treat yourself, then help others. Follow up with injured at hospital
- If there is a fire try to put it out with help of people around you.
- Clean and rehabilitate the disaster site.
- If people are buried under the debris, call for help of the rescue teams and render your help.

GETTING BACK TO NORMAL

- Establish a program to restore both the disaster site and the damaged materials to a stable and usable condition.
- Determine priorities for restoration work and seek the advice of a conservator as to the best methods and options, and obtain cost estimates.
- Contact insurers.
- Analyse the disaster and improve the plan in the light of experience.
- Eat something to make you feel better and more capable of helping others.
- When you can move out of the place carry with you essential food, water container, torch, transistor radio and medicines you normally use.
- Do not drink water from open sources/ containers without filtering or purification.

9.6.12 Resource Requirements

Fire Fighting Equipment

- Fire hydrant system (Refer Annexure No. 1).
- Water sprinkler system.
- Portable Fire extinguishers.
- PPE, SCBA, Fire suit.

Search and Rescue Equipment

- Ropes, ladders
- Portable flood lights, Search light.
- Combustible gas, CO and Oxygen detector
- Cutting set

Specialized Heavy Earthmoving Equipment

- JCB
- Dumper
- Crane

9.6.13 Terms and Definitions

Earthquake: A sudden slipping or movement of a portion of the earth's crust, accompanied and followed by a series of vibrations.

Aftershock: An earthquake of similar or lesser intensity that follows the main earthquake.

Fault: The fracture across which displacement has occurred during an earthquake. The slippage may range from less than an inch to more than 10 yards in a severe earthquake.

Epicentre: The place on the earth's surface directly above the point on the fault where the earthquake ruptures began. Once fault slippage begins, it expands along the fault during the earthquake and can extend hundreds of miles before stopping.

Seismic Waves: Vibrations that travel outward from the earthquake fault at speeds of several miles per second. Although fault slippage directly under a structure can cause considerable damage, the vibrations of seismic waves cause most of the destruction during earthquakes.

Magnitude: The amount of energy released during an earthquake, which is computed from the amplitude of the seismic waves. A magnitude of 7.0 on the Richter scale indicates an extremely strong earthquake. Each whole number on the scale represents an increase of about 30 times more energy released than the previous whole number represents. Therefore, an earthquake measuring 6.0 is about 30 times more powerful than one measuring 5.0.

9.6.14 Revision/ rehearsal/ drill/ history

Sr. No.	Date Of Revision/updating	Revision No.	Reason For Revision
1.	XXX	0	Nil, First edition.

9.7 SOP FOR FLOOD

26 July 2005 Floods

In Mumbai, if you mention the date 26 July, many of those old enough will assume you are talking about the day in the great Indian city was brought to a standstill by severe flooding. Over 1,000 people were dead in the floods across the state of Maharashtra, many of them in Mumbai. Torrential rain hammered the state for 4 days. In Mumbai, as much as 994 mm (39.1 inches) of rain fell in just 24 hours. Trains, airports, roads, subway, hospitals, schools and even mobile telephone networks were in chaos. Much of the flooding in Mumbai occurred along the 18 km long Mithi River, a river in Salsette Island which merges into the sea at Mahim creek. The downpour increased levels of Lake Powai, which started to overlow, spilling vast amounts of water into the Mithi.

In a study in the Indian Institute of Technology-Bombay (IIT-B), Monash Academy and IIT-B's Interdisciplinary Program in Climate Studies found areas spanning from Worli, Prabhadevi, Elphinstone to Santacruz, Saki Naka, Kurla, Chunnabhatti and Chembur, Deonar, Trombay, Govandi and Mankhurd are at a maximum risk of floods and landslides (http://www.hindustantimes.com/mumbai/5-mumbai-wards-at-risk-of-floods-landslides-study/story-p33hYmkp5bhUnE8WtLltaN.html).

9.7.1 Incident Scenario

Heavy rain, followed by flooding of the locality, submerged roads resulting in to blocked access to site, potential for damage to properly and loss of life.

9.7.2 Scope

This SOP is applicable for the site flooding incidents.

9.7.3 Purpose

The purpose is to search and rescue operations of the persons trapped in the flooded and evacuation of people to safe location from vulnerable zone.

9.7.4 Impact Zones

SR. No.	Scenario	Impact Zone
1.	Earthquake.	Depends of intensity of earth quake.
2.	After effect fires.	Refer SoP No. 3.
3.	After effect flood.	Not anticipated at site.

9.7.5 Emergency Response Agency

❖ Primary Agency

- Fire and security Department

❖ Secondary Agencies

- Fire brigade and Police.
- The fire services in the Urban Local Bodies (ULB's).

- District Disaster Control Cell.
- RIT's.
- NGO's.

9.7.6 Dos and DON'Ts

DO'S

- Stay away from downed power lines.
- In high flood-prone areas, keep materials on hand like sandbags, plywood, plastic sheeting, and plastic garbage bags.
- Be aware of drainage channels and areas known to flood, so that you or your evacuation routes are not cut off.
- If you choose or are told to evacuate, move to a safe area before access is cut off by flood water.
- Monitor local radio/ television broadcasts.

DON'TS

- Do not panic.
- Avoid driving into water of unknown depth. Moving water can quickly sweep your vehicle away.
- Do not allow children to play in flooded areas.
- Test drinking water for portability; wells should be pumped out and the water tested before drinking.
- Do not use fresh food that has come in contact with floodwaters.
- Do not to move into flooded areas because the authorities may have removed the manholes for efficient drainage and the indicators may get shifted due to water currents.
- Do not walk on footpath covers may have been dislocated due to current
- Do not enter damaged buildings or structures
- Do not touch electric poles, utility wires/cables
- Do not use telephones except in life-threatening situations

DURING EVACUATION

- The entire family would evacuate together as a unit. However, to avoid stampede and confusion and in cases of inadequate transport or limited time, emergency evacuation would be undertaken in the following order:
    a) Seriously injured and sick
    b) Children, women and handicapped
    c) Old
    d) Able bodied
- Secure their homes/establishments. Close and lock doors and windows
- Turn off the main water valve and electricity.
- Leave early enough to avoid being trapped.
- Follow recommended evacuation routes.
- Not to take shortcuts. They may be dangerous.
- Stay away from downed power lines.

9.7.7 Prevention and Mitigation Activities

- Provision of life jackets, ropes.
- Provision of PPE.
- Provision of smoke detectors and Alarm system.
- Water sprinkler.
- CCTV.
- PAS System.

9.7.8 Preparedness Activities

- Mock drill
- Prepare back up teams ready for rotation of personnel.
- Keep a torch light and a working transistor radio with spare batteries.
- Display an updated list of emergency telephone numbers.
- Ensure that communication equipment are in working order
- Estimate your vulnerability to floods by determining the elevation of your property.
- Evaluate and check your insurance coverage. As construction grows around areas, flood prone areas change.

9.7.9 Response Activities

- Raising the site emergency alarm
- Inform police, Fire brigade and Mobilizing site emergency services
- Determination of level of emergency, help from Advisory team if required
- Mobilizing EoC and AP
- Mobilizing Emergency Respondent teams, IRT's, NGO's.
- Mobilizing resources required for emergency response teams working
- Co -ordination between all emergency services
- Communication with district disaster control cell and declaring off site emergency (if situation escalates)
- Head count at AP and feed back to SAR team
- SAR and Evacuation
- SOP implementation by the emergency response teams
- Traffic control, law and order situation and crowd control.
- Release of authorized information to the media.
- Emergency under control report to CSC
- Termination of emergency and 'All Clear Alarm'.

9.7.10 Life Saving Measures

- Let the unconscious person lie on side position,
- Give artificial respiration

9.7.11 Recovery Activities

- Get the de-warning from chief site controller and announce the same
- Information centres will be set up to provide response information to the public, relatives of victims and media
- Replenishment of used stocks of rescue materials
- Follow up of injured at hospital.
- Setting up help desk
- Record keeping
- Clean and rehabilitate the disaster site.

- Determine priorities for restoration work and seek the advice of a conservator as to the best methods and options, and obtain cost estimates.
- Contact insurers.
- Analyse the disaster and improve the plan in the light of experience.

9.7.12 Resource Requirements

- Life jackets
- Search and rescue equipment - Ropes, ladders, Search light.
- PAS System.

9.7.13 Terms and Definitions

Mitigation

Activities taken to reduce the severity or consequences of an emergency.

Preparedness

Activities, tasks, programs, and systems developed and implemented prior to an emergency that are used to support the prevention of, mitigation of, response to and recovery from emergencies.

Response

Immediate and ongoing activities, tasks, programs, and systems to manage the effects of an incident that threatens life, property, operations, or the environment.

9.7.14 Revision/ Rehearsal/ Drill/ History

Sr. No.	Date Of Revision/updating	Revision No.	Reason For Revision
1.	XXX	0	Nil, First edition.