EMERGENCY PREPAREDNESS AND DISASTER MANAGEMENT PLAN

POWAI WEST

OBJECTIVES

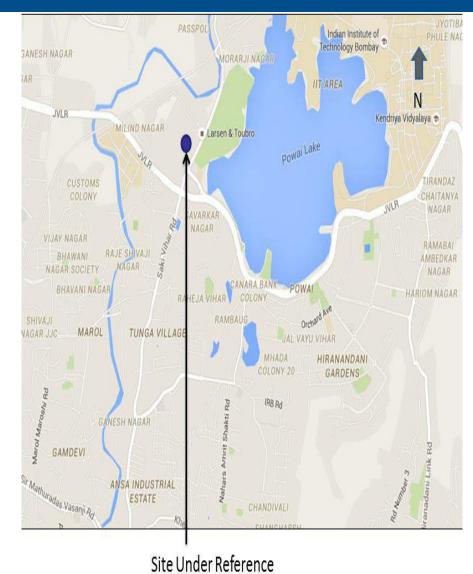
- Preserving the life, property and environment from the consequences of emergencies arising within the site.
- Systematically coordination of emergency control action to arrest escalation of emergency, to evacuate personnel within or outside the site where necessary and to rehabilitate them.
- Restoring normalcy in site operation with minimum loss of time
- To safe guard the lives of all the personnel in the premises of the Office Building and Powai West.
- To safe guard the assets of the Office Building and Powai West.
- To train the employees for the effective handling of the situation.

SITE PLAN

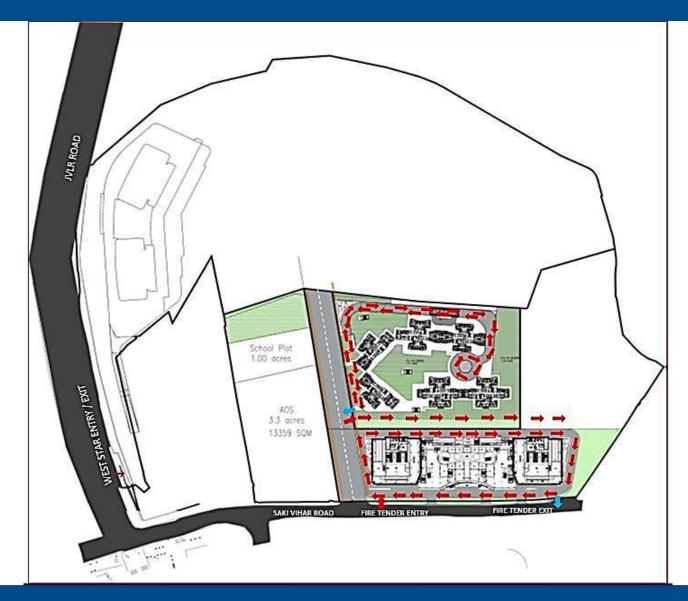


GOOGLE IMAGE WITH LOCATION PLAN





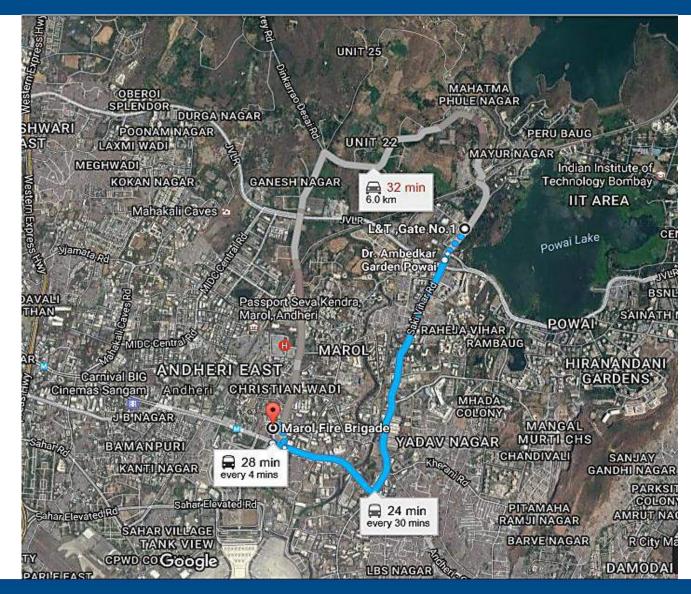
FIRE TENDER MOVEMENT – POWAI WEST



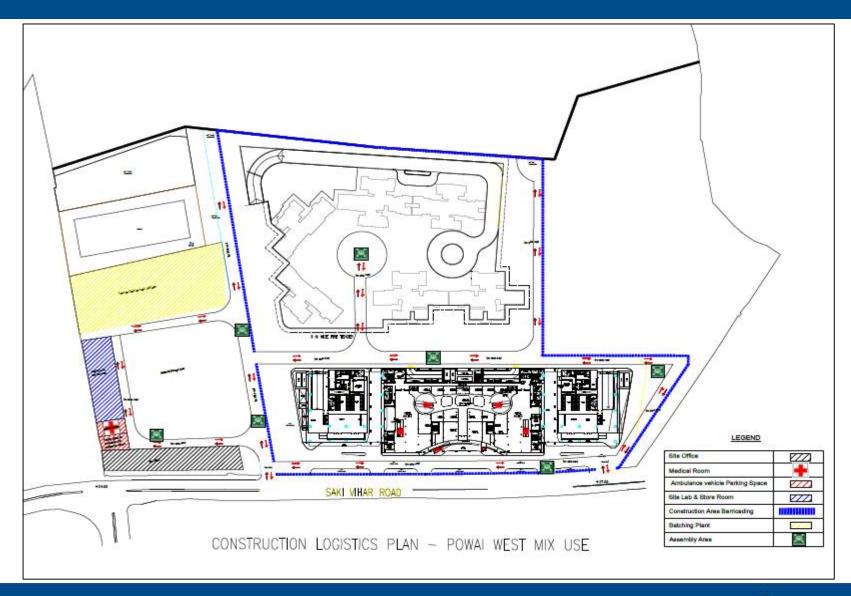
FIRE STATIONS



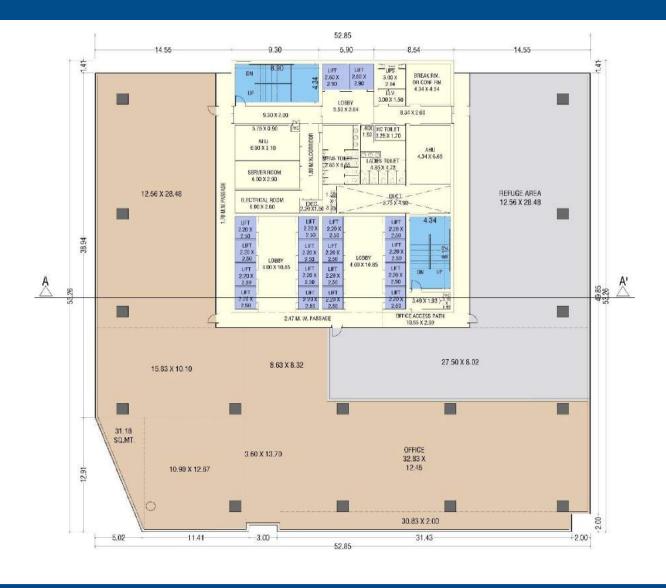
NEAREST FIRE STATION



SITE LOGISTIC LAYOUT PLAN

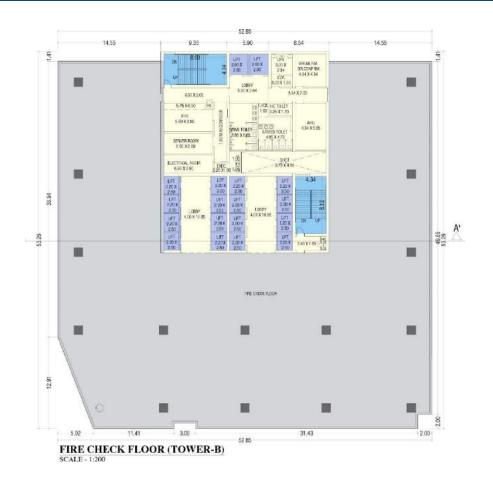


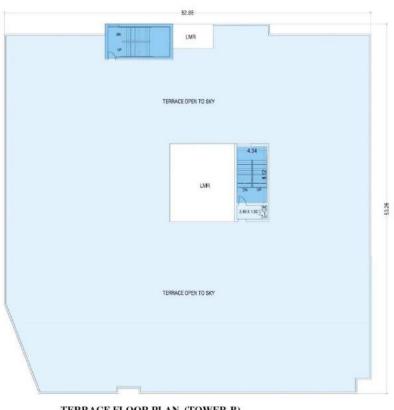
COMMERCIAL AND RETAIL - REFUGE FLOOR (5TH & 13TH FLOOR)— TOWER B





COMMERCIAL AND RETAIL - FIRE CHECK FLOOR & TERRACE FLOOR PLAN

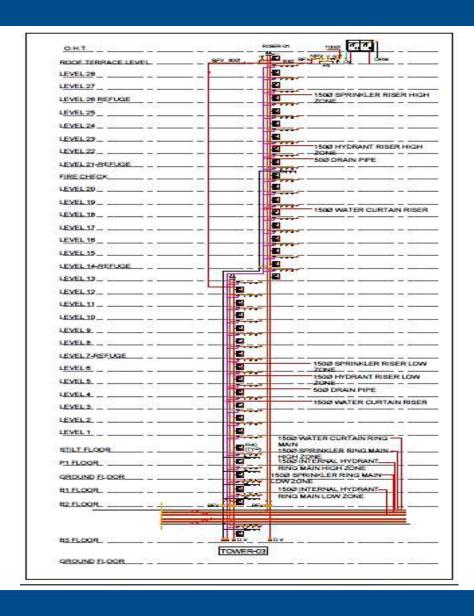




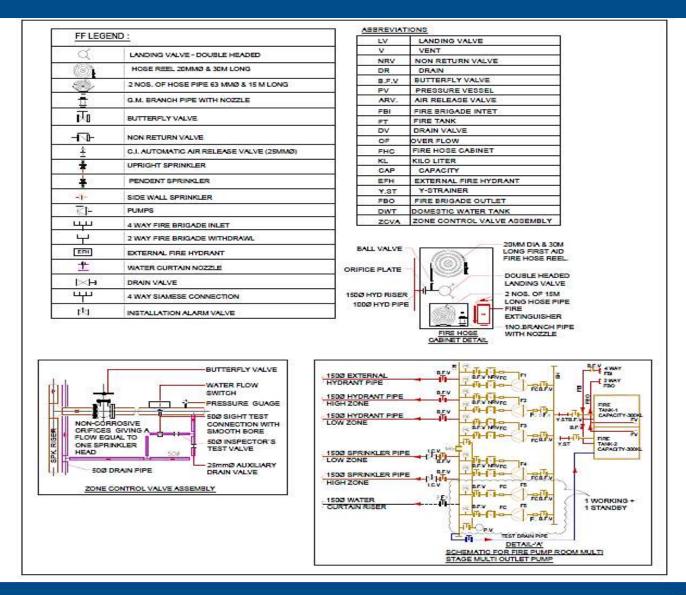
TERRACE FLOOR PLAN (TOWER-B)



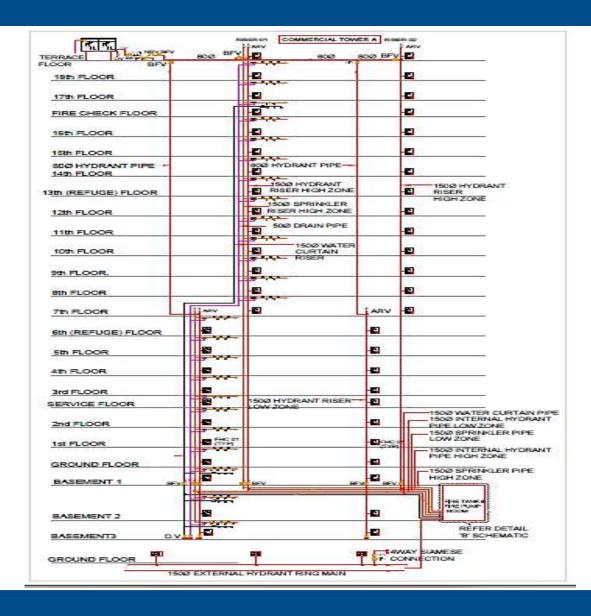
RESIDENTIAL FIRE SCHEMATIC LAYOUT



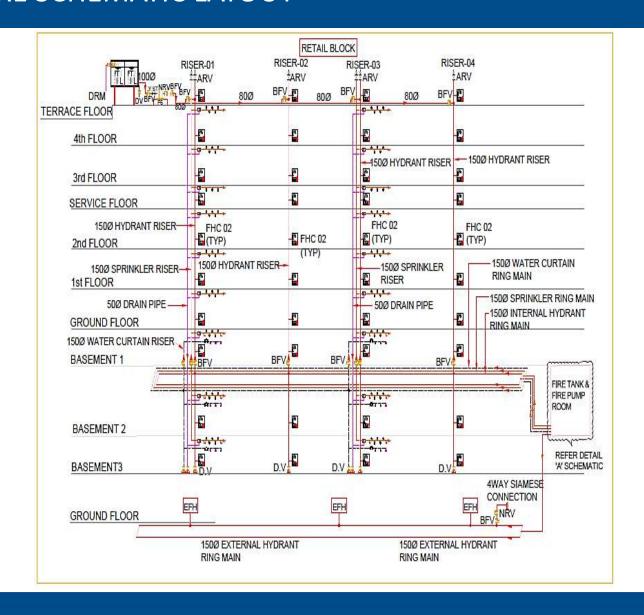
RESIDENTIAL FIRE SCHEMATIC LAYOUT



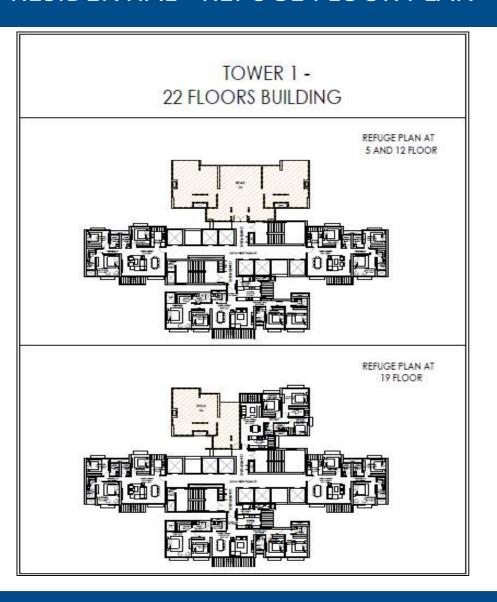
COMMERCIAL - FIRE SCHEMATIC LAYOUT

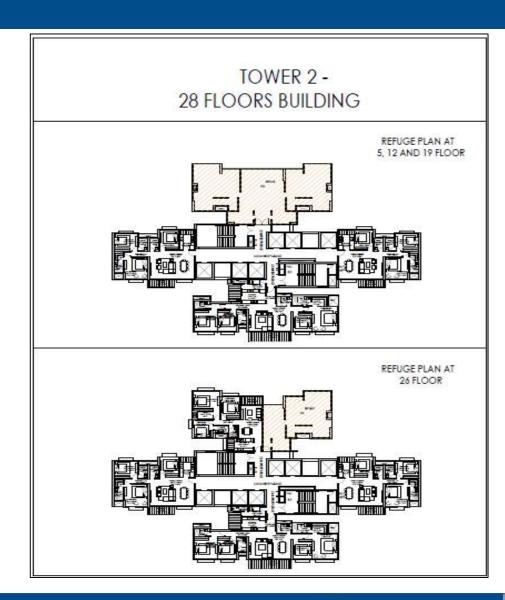


RETAIL - FIRE SCHEMATIC LAYOUT

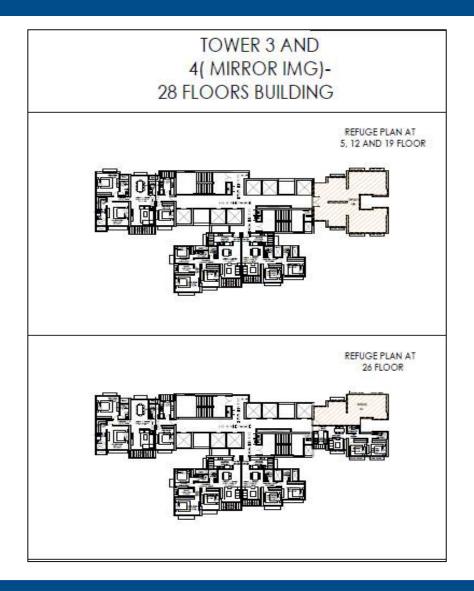


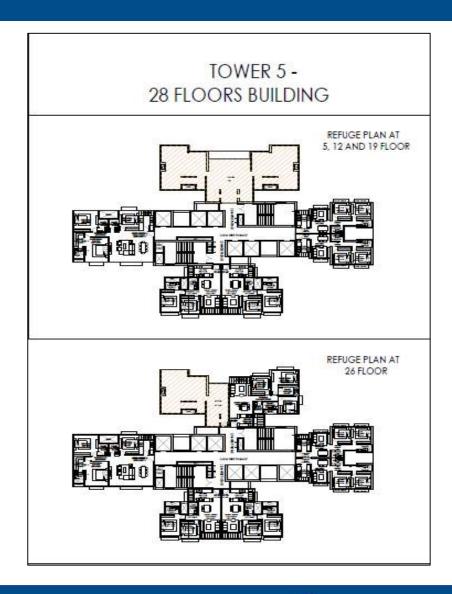
RESIDENTIAL - REFUGE FLOOR PLAN



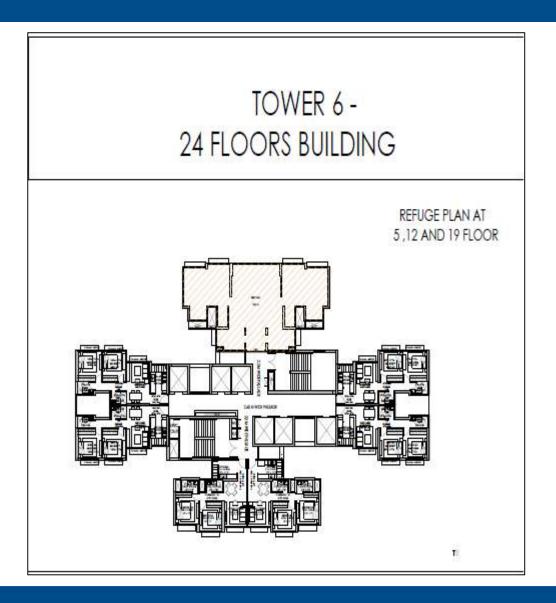


RESIDENTIAL - REFUGE FLOOR PLAN





RESIDENTIAL - REFUGE FLOOR PLAN



LIKELY HAZARDS AT SITE

SR. HAZARD		ACCIDENT SCENARIO	IMPACT ZONE	DEMOLITION PHASE	CONSTRUCTION PHASE	OPERATIONAL PHASE
1.	Physical Hazard.	Material handling operations, Theft.	Local.	✓	·	79 <u>82</u>
2.	Physical Hazard.	Fall from height.	Local.	✓	1	✓
3.	Physical Hazard.	Structural instability Fall of structure/ part of construction, crane, excavation by JCB etc.	Local.	1	~	7 <u>82</u> 5
4.	Physical Hazard.	Failure of lift, lifting ropes, tackles , Personnel trapped in confined space etc.	Local.	V	1	V
5.	Physical Hazard.	Wild animal ,Snake bite , Honey bees	Local.	✓	· /	192
6.	Fire/ Explosion.	Transformer, AC fire/ explosion.	Local.	1	✓	✓
7.	Electrical Hazard.	Shock, overloading of cables, short circuit fire, snapping of HT power cables, welding operation, Total electrical failure.	Local.	~	1	✓
8.	Hazardous Waste.	Products, such as paints, cleaners, oils, batteries, mercury containing lamps and pesticides that contain potentially hazardous ingredients.	Local.	~	~	√
9.	Health Hazard.	Electronic waste, batteries., organic waste	Local.	1	~	/
10.	Fire.	Spill of Diesel drum at DG set followed by fire.	Site.	/	✓	·
11.	Fire/ Explosion.	LPG cylinders release followed by fire/ explosion.	Site.	1 40	1. -	✓
12.	Fire.	Fire during welding, cutting operations.	Site.	✓	✓	1945
13.	Fire/ Explosion.	Bio gas release fire/ explosion.	Site.	1 48	1. -	✓
14.	Health Hazard.	Stroke / Heart attack	Site.	✓	✓	·
15.	Vehicle Accident.	RMC Truck traffic from Batching Plant to project site, Traffic jam, vehicle accidents, blind spots.	Site.	V	·	V
16.	Evacuation.	Explosion ,Civil unrest , Death threat ,Bomb threat, Suspect mail /parcel ,Stampede at staircase , gate ,	Off Site.	-0	: -	✓
17.	Fire.	Uncontrolled grass fire in surroundings.	Off site.	1	✓	· ·
18.	Natural Calamity.	Earth quake/Land slide.	Off site.	✓	✓	~
19.	Natural Calamity.	Flooding.	Off site.	1	✓	~
20.	Natural Calamity.	Cyclone -communications failure, Lightning strike , Hail storm ,	Off site.	✓	~	~
21.	Health Hazard.	Fugitive Dusting.	Offsite.	✓	✓	× -
22.	Health Hazard.	Black smoke generating machinery.	Offsite.	1	·	V522
23.	Neighborhood/ Area Emergency.	Industrial incident , Toxic gas release, riot, bomb threat.	Offsite.	~	1	1

RISK RATING MATRIX

$RISK(R) = SEVERITY \times PROBABILITY$ SEVERITY OF RISK R=1 R=2 R=3 LOW (1). Category 1 Category 1 Category 2 PROBABILITY OF RISK R=2 R=4R=6 MEDIUM (2). Category 1 Category 2 Category 3 R=3 R=6 R=9 HIGH (3). Category 2 Category 3 Category 3 LOW (1). MEDIUM (2). HIGH (3). There are 3 categories defined in the above diagram. : R Factors of 1 & 2 Category No. 1 Which requires less attention to be paid. Category No. 2 R Factors of 3 & 4 Which requires comparatively less attention to be paid.

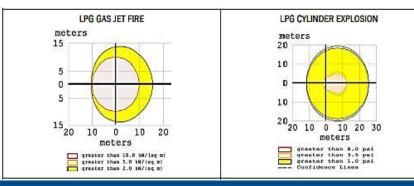
Category No. 3

R Factors of 6 & 9

Which requires a good amount of attention/ maximum attention.

HAZARD VULNERABILITY RISK ANALYSIS

HAZARD	WING A	WING B	WING C	
Flood/ Heavy Rain.	Low.	Low.	Low.	
Earthquake.	Medium	Medium	Medium	
Road Accidents.	Low.	Low.	Low.	
Fire.	Medium	Medium	Medium	
Neighborhood Incidents.	Medium	Medium	Medium	
Epidemics.	Low.	Low.	Low.	
Structure Collapse.	Low.	Low.	Low.	
Festivals Fire Work.	NA	NA	NA	
Landslides.	Low.	Low.	Low.	
High Wind/ Cyclone.	Low.	Low.	Low.	
Civil Unrest.	Medium	Medium	Medium	
Terrorist/ Bomb Threat.	Medium	Medium	Medium	
Evacuation/ Stampede.	High.	LOW	High.	



	ACCIDENT SCENARIO RELEASE FROM TANK	DOWNWIND AFFECT DISTANCE (m)							
SR.		FLAMMABLE VAPOR CLOUD (LEL)		BLAST OVER PRESSURE (psi)		THERMAL RADIATION (KW/m²)			
NO.		60 %	10 %	8	3.5	1	10	5	2
<u></u>		00 70	10 /0		0.0			-	-
1.	Diesel Pool Fire.	-	-	-	-	-	11	12	13.5
2.	LPG Gas Jet Fire.	<10	19	-	-	-	<10	<10	<10
3.	LPG Cylinder Release & Jet Fire.	14	45	-	-	-	<10	<10	<10
4.	LPG Cylinder Explosion.	-	-	NA.	12	26	-	-	-



DISASTER MANAGEMENT TEAM

CHIEF CONTROLLER
Mr. D.C Mandlik

DY.CHIEF CONTROLLER Col. Sachin Kulkarni

EMERGENCY TEL. No.: 4000

SITE CONTROLLERS

■TC II Bldg: Mr. P Muthu Kumar & Mr. Bhuwan C Kharkwal

Powai Project : Mr. Shankar L Chowke

■ MEDICAL IN-CHARGE Dr. K. J. Kamat

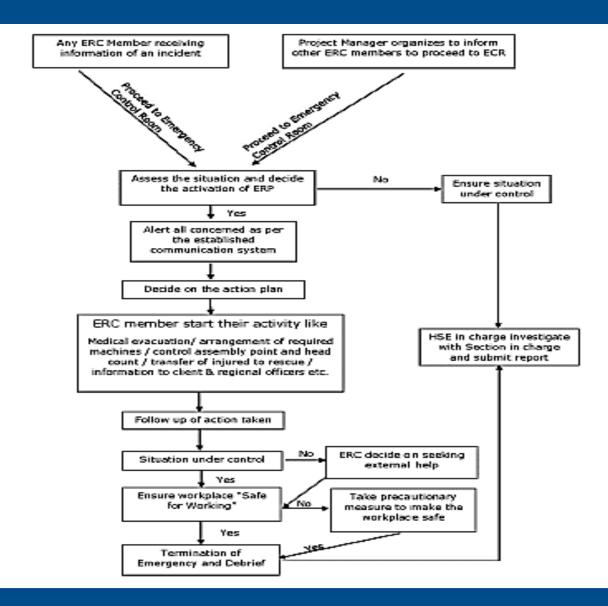
ENGINEERING IN-CHARGE Mr. Manish Shah

• FIRE & SAFETY IN-CHARGE Mr. Rajeev Soni

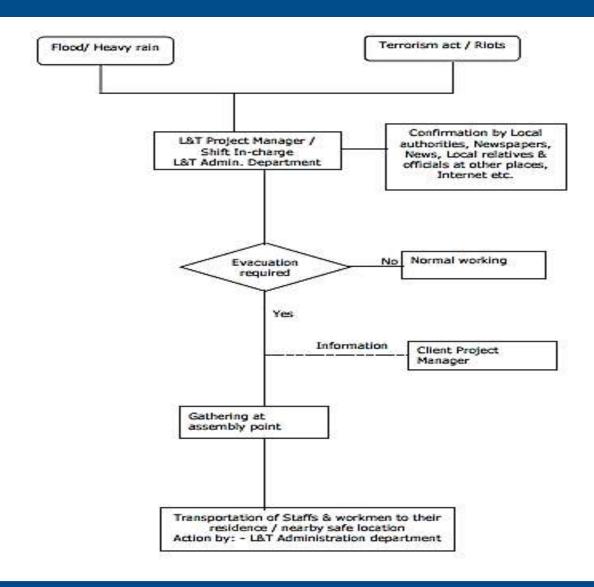
L&T CONSTRUCTION EMERGENCY RESPONSE TEAM

S No	Name	Designation	Contact No.
1	C. B. Reddy	Project Head	7718822279
2	Swapnil Deshmukh	Project Manager	9702775278
3	Shankar L Chowke	EHS Manager	7738027785
4	Joydip S Choudhury	Planning Manager	9004207398
5	Sriram N	Construction Manager (TC-IV)	9819317437
6	Ajit Y. Jamble	Construction Manager (Finishing)	9867263595
7	Ganesh Chavanke.	Asst.Construction Manager (Tower1& 6)	9970641513
8	Yogesh R. Borase	Construction Manager (Tower 2 & 5)	9619927683
9	Ponkumar	Asst. Construction Manager (Tower 4)	8698361965
10	Ganesh Kumar Pammi	P&M In Charge	9619180836
11	Prakash S Khekare	Accounts & Admin In-charge	9869023391
12	Niraj A Shah	Asst. Admin In-charge	9821850951
13	S. Das	QAQC Manager	9545572167
14	Jasmeet Singh	MEP In-charge	9769437969
15	Chandrashekhar Iyer	Store In-charge	9820067687
16	Lalit Athalye	IR Supervisor	9987556821

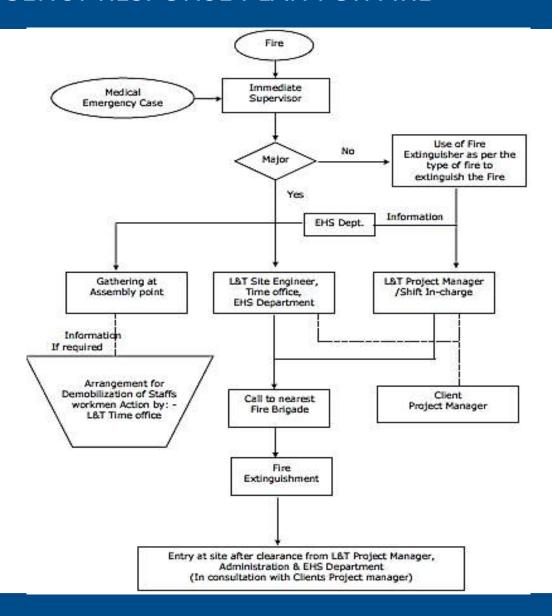
EMERGENCY RESPONSE PLAN



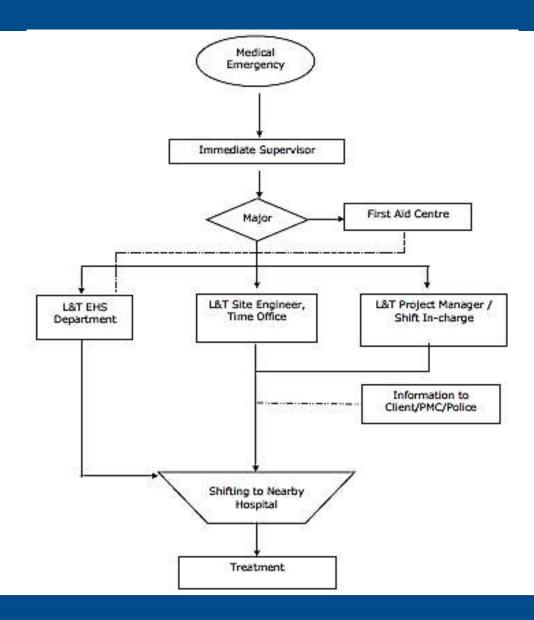
SITE SPECIFIC EMERGENCY RESPONSE PLAN FOR FLOOD AND RIOTS



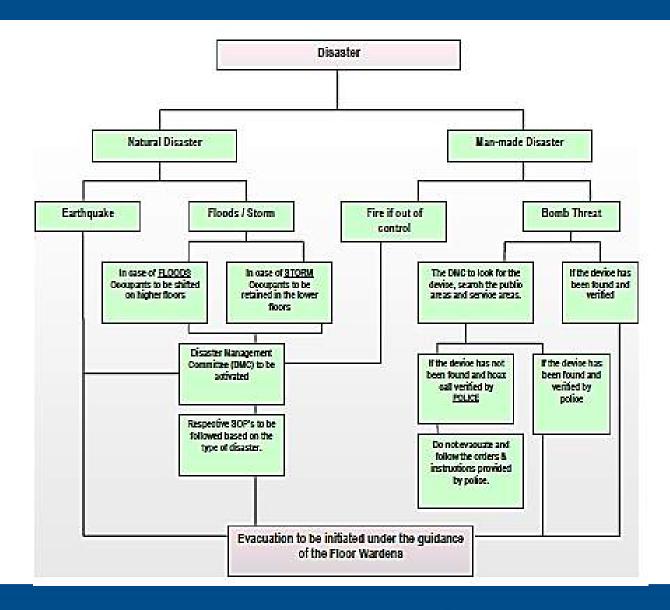
SITE SPECIFIC EMERGENCY RESPONSE PLAN FOR FIRE



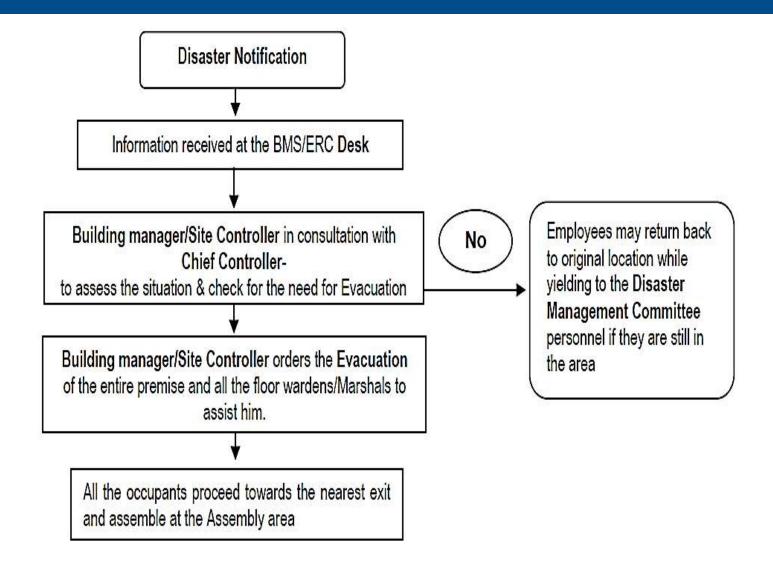
SITE SPECIFIC EMERGENCY RESPONSE PLAN FOR MEDICAL EMERGENCY



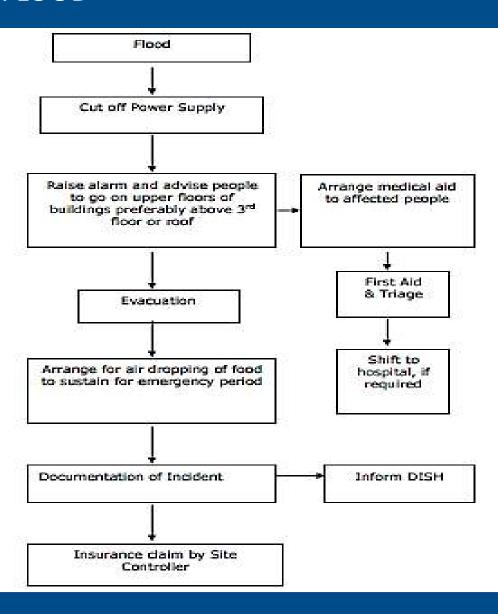
DISASTER RESPONSE PLAN



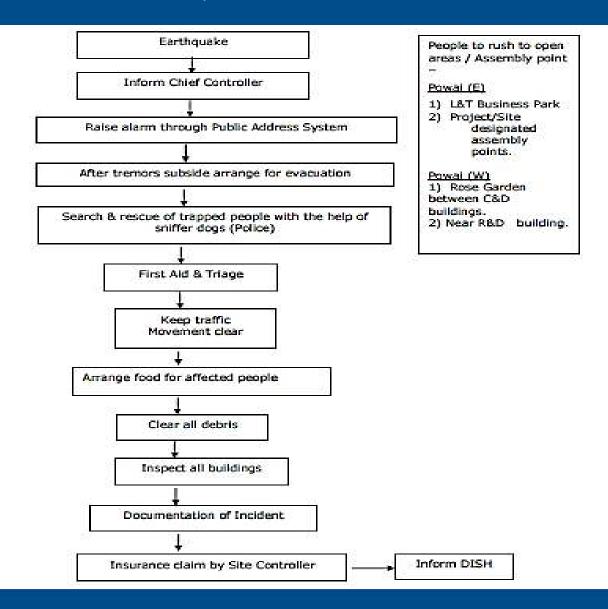
EVACUATION PLAN IN CASE OF EMERGENCY



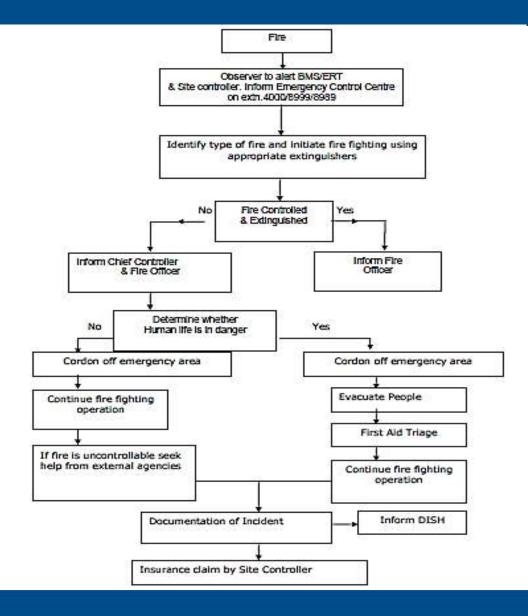
GUIDELINES IN CASE OF FLOOD



GUIDELINES IN CASE OF EARTHQUAKE



GUIDELINES IN CASE OF FIRE



COMMON RISK MITIGATION MEASURES

- Earthquake resistant design of structures. IS 456 2000 & IS 1893 (Part I) 2002.
- Fire detection and alarm system.
- Smoke detector at meter room and at each floor.
- Coverage under Lightening arrestor
- Watch & ward Guards and CCTV coverage.
- Prohibition of smoking signs.
- LIFT: ARD system for Lift (Auto Rescue Device), Intercom, Fire Alarm, Fire Resistant Door.
- Water removal arrangement from lower level floors to outside storm drain.
- Safety instructions and signage display.
- Work Permit System during construction phase.
- Supervision of construction work.

COMMON RISK MITIGATION MEASURES

- Lights during Late Night Hours
- DG set for Emergency power (DG set will be of silent type with acoustic enclosure.)
- Barricade during construction phase.
- Access from all sides for fire fighting to all buildings.
- Public Address System at ECC, Addressable fire alarm system.
- PPE & RESCUE EQUIPMENTS: Search Light, Safety Net, Safety Belt, Mask, Helmet, Earplugs,
 Rope, Gas Cutter/ Hammer/ Life jackets at Security Office of the complex.
- Fire Drill, Mock Drill and Community awareness drive.
- Glass break fire on each floor alarm at ground floor.
- Two Hour Fire resistant door.
- Water sprinkler at stair case, lift lobby, parking and Water Curtain for façade system.
- Design Code: NBC Code & DC Regulations.

SOPS FOR EACH DISASTER AND FOR EVACUATION WHEN NECESSARY

Earthquakes

- Search for a safe place
- Check for the evacuation routes
- Intimate and co-ordinate with the Team appointed
- If caught inside stand with their backs against a strong indoor wall
- If caught outside run to an open space away from trees, buildings and electric lines
- If in a moving vehicle stop and stay inside
- Communicate the assessment findings to other Task Force groups
- Establish a distribution centre or community
- Prioritize the elderly persons, pregnant women, children and injured persons
- Make immediate repairs to broken or burst pipes.
- Coordinate with the sanitation group to ensure sufficient water availability

Cyclones

- Remain in shelter
- First Aid team to provide primary health care
- Conduct a general hazard assessment
- Clear debris and fallen trees
- Assess the Drinking water supply and available water resources

SOPS FOR EACH DISASTER AND FOR EVACUATION WHEN NECESSARY

Fire

- Move towards the designated refuge areas.
- Intimate and co-ordinate with the Team appointed.
- If possible the fire extinguishers provided at designated places can be used.

Flood

- Arrangement for safe evacuation of the occupants
- Intimation to the external authorities as mentioned in this plan
- Guide the way towards safe evacuation of the building.
- Arrange for relief and rehabilitation space
- Arrange for medical assistance, food.
- Occupants should not drive during flood
- Occupants should not move closer to any electrical pole or line while evacuation process
- Switch off the main power supply of the building

SOPS FOR EACH DISASTER AND FOR EVACUATION WHEN NECESSARY

Unrest

- Adequate precautions to be taken for work sites close to areas prone to political / communal unrest.
- Information can be obtained from television, radio, newspaper / any other Sources.
- Assemble at emergency assembly point
- Declaration of emergency situation by Project Manager, Construction Manager.
- Evacuation of workmen & staff from emergency assembly point to a safe shelter by time office.
- Security arrangement to be ensured in coordination with local police station.
- In case of military aggression, air raids, additional arrangements e.g. Military protection / bunkers may be required.
- Arrangement for flood, drinking water & medical aid by package I/c
- District emergency authority.
- In case of short notice, all the identified persons to contact themselves act as mentioned above.
- After the emergency is over, the normal situation is to be declared by Project Manager,
 Construction Manager.
- Staff, workmen, & family to be rehabilitated.

SOPS FOR EACH DISASTER AND FOR EVACUATION WHEN NECESSARY

Bomb threat

- Immediately on receipt of a bomb threat, the recipient will inform the Site Controller / Chief Security Officer/Chief controller or whoever next in hierarchy is present in the building at that time.
 All bomb threats must be treated as real and handled as such.
- Site controller will immediately inform the **Chief Controller/Dy. Chief Controller** and, in consultation with him, inform the **police**, **fire-fighting** and **the bomb disposal authorities and arrive at a decision to evacuate the property**.
- If it has been decided to evacuate the property immediately, actions contained in the SOP on Evacuation will be initiated
- If the location of the alleged bomb has not been indicated by the caller, zone-wise search parties under the respective Zone-Wardens will be instructed to carry out a search. If the location of the alleged bomb has been indicated by the caller, nominate a team under the Chief Security Officer to reach the location, search for the alleged bomb and if the bomb or an unattended object is noticed, take the following actions:-
 - Organise a cordon of the affected area from a safe distance.
 - Carry out local evacuation of the affected area by removing all persons from there.
 - Keep the alleged bomb/object under constant observation.
 - Continue reporting the situation to the Chief Controller.
 - Hand over the situation to the police and the bomb disposal personnel on their arrival.
 - Carry out total evacuation, if ordered.

SOPS FOR EACH DISASTER AND FOR EVACUATION WHEN NECESSARY

Terrorism

- On receiving the information regarding a **Terrorist attack** in the building the BMS/Site Controller must be informed.
- Seal all access points to the building and order for the people to gather at the assembly point in the building and activate disaster management team in operation.
- He would inform as per hierarchy and wait for the instructions, will call the police/call for the Ambulance and for the Fire Brigade.
- The Chief controller will be informed immediately.
- The following steps should be followed
 - Review emergency evacuation procedures.
 - Know where the fire exits are located.
 - Keep fire extinguishers in working order. Know where they are located and how to use them
 - Training for first aid should be given.

BUDGETED COST FOR LIFE & FIRE SAFETY EQUIPMENTS

Sr. No.	Particulars	Amount (Rs.)
1	D.G. Sets & Earth Pits	6,77,20,000
2	Fire Fighting System with (with All pumps)Wet Risers, External Hydrant System, Sprinkler System, Drenchers (@ Fire break Floor& Podiums) Fire Extinguishers, Fire Buckets, Signages & FHC doors	23,80,00,000
3	Fire Elevators (Service)	
4	Fire Elevators (Passenger)	12,04,00,000
5	Earth strips for Elevators	
6	Lightening Arrester	25 00 000
7	Earth Strips for Lightening Arrester	25,00,000
8	Earth Pits for D.G. Set, Fire Elevator & Lightening Arrester	Cost is included in Sr. No. 1
9	Mechanical Ventilation System and Staircase & Lift Lobby Pressurisation System	5,50,00,000
10	Fire Alarm System - Included in Fire Fighting system	6,00,00,000
	Total Budgeted Amount for Fire & Life Safety Equipments	54,36,20,000

BUDGETED COST FOR LIFE & FIRE SAFETY EQUIPMENTS

Sr. No.	Disaster	Mitigation measures during operation phase	Cost (Rs.)	
		Emergency Dewatering cutter pump	Not Applicable	
	Flood	Sump pump in basement	20,00,000	
1		SWD system with oil and grease traps	15,00,000	
		Provision of sprinkler drain system	Not Applicable	
2	Earthquake	Cost of structural safety	3,00,00,000	
		Lightening Arrester		
3	Lightening	Earth Strips for Lightening Arrester	25,00,000	
		D.G. Set Earth Strips for D.G. Set	6,77,20,000	
4	Fire	Fire Fighting System with (with All pumps)Wet Risers, External Hydrant System, Sprinkler System, Drenchers (@ Fire break Floor& Podiums) Fire Extinguishers, Fire Buckets, Signages & FHC doors	23,80,00,000	
		Fire Elevators (Service) Fire Elevators (Passenger)	12,00,00,000	

BUDGETED COST FOR LIFE & FIRE SAFETY EQUIPMENTS

		Earth strips for Elevators	4,00,000
4	Fire	Fire Alarm System & PA System	6,00,00,000
		Mechanical Ventilation System and Staircase & Lift Lobby Pressurisation System	5,50,00,000
5	Rescue equipments	Fire escape chute	Not applicable
6	Medical Equipments for	Wheel chairs, Stretchers, First aid box containing general medicines and equipments	10,00,000
	emergencies	Reflecting jackets, life jackets, SCBA, dust masks, harness	10,00,000
7	Aircraft collision	Aircraft Warning Lights	8,00,000
8	CCTV	Installation cost for CCTV	12,00,000
		Total cost	47,31,20,000

COST TOWARDS MITIGATIVE MEASURES DURING CONSTRUCTION PHASE

Sr . No.	Disaster	Mitigation measures during construction phase	Cost (Rs.)
	Excavation	Establish and maintain a safety and health program for the worksite	18,00,000
1		Use barricades, hand or mechanical signals, stop logs to keep operators safe	2,50,000
		Barricade or cover wells, pits, shafts	10,00,000
		Periodic Inspection	10,00,000
	Safety Tools (Nipping, Injury to Hand, Electrical Shocks & wiring, Leg Injury, welding, injury)	' '	26,00,000
2		Safety guard in case of Grinder	3,00,000
		Ergonomic training	1,00,000
		Safety belt	63,00,000
		Periodic check & 3rd party certification	10,00,000
	Tower crane	Preventive maintenance	2,15,00,000
3	Construction / material Hoists	Use of PPA/PPE	1,00,000
		Audit & Certified by Competent person	-
		Operated by trained & Certified person	12,00,000
4	Passenger lift	Certified/approved passenger lift to be used by trained employees	98,00,000
-	_	Safe area demarcation	50,000

COST TOWARDS MITIGATIVE MEASURES DURING CONSTRUCTION PHASE

5	Portable electrical equipment	To be checked before use by Approved Electrical safety official	8,00,000
6	Pressure vessel	Inspection of Safety valve, proper rubber fittings, Vibration to be avoided	10,00,000
		Use of PPE/PPA, Training	1,50,000
7	Scaffolding	Introduction of Working on Height permit system, PPE/ PPA/ safety belt /Training	1,00,000
		Wearing dust mist masks	8,00,000
		Use of protective goggles when working with the raw materials used for mixing concrete	5,55,000
8	Batching plant	Use of gloves while working with wet concrete	32,00,000
		Enclosing the whole plant & rubber and wood pad damping	-
		Inspection of guards and barricading before operation	2,00,000
10	Debris & construction waste	Installation of debris chute/ safety net/ time to time its disposal and recycling procedure	2,50,00,000
11	DMP Team	Allotting safety team	4,10,00,000
		Total cost	11,98,05,000

CONSTRUCTION PHASE

Sr. No.	Description	Quantity Powai West	Cost	Cost per yr.	For 5 year along with Maintenance
	Fire				•
1	Water reservoir	250	17500	4375000	54,68,750
2	Hydrant line & Valve	750	3800	2850000	35,62,500
3	Temporary hydrant Pumps	10	400000	4000000	50,00,000
4	Portable fire extinguishers				
4.1	DCP	210	2475	519750	20,79,000
4.2	Foam	110	1406	154660	6,18,640
4.3	CO ₂	150	4106	615900	24,63,600
4.4	Fire Buckets	210	250	52500	2,10,000
4.5	Fire Blankets	210	200	42000	1,68,000
5	Fire Marshals	4	17500	70000	2,80,000
6	Rescue cage	6	150000	900000	9,00,000
7	Ambulance	1	45000	45000	1,80,000
8	Ambulance Room / First aid centre	1	150000	150000	3,00,000
9	Doctors	1	50000	50000	2,00,000
10	Train first aiders / Male nurse	4	20000	80000	3,20,000

CONSTRUCTION PHASE

				Total	3,18,70,040
3	Temporary pipe arrangement / Hose pipe	2000	250	500000	20,00,000
2	Life buoys 6 500 3000		12,000		
1.2	Diesel pumps 5 75000 375000		15,00,000		
1.1	Submersible pumps	15	45000	675000	27,00,000
1	Dewatering Pumps				
	Flood				
23	CCTV (Wi Fi)	50	25000	1250000	12,50,000
17	Wheel chair	4	2500	10000	10,000
16	Wacky talkie	110	8500	935000	11,68,750
15	Public address system Mega phone	4	25000	100000	4,00,000
14	Hand siren	6	25000	150000	6,00,000
13	SCBA	6	1200	7200	28,800
12	Traffic Marshals	6	17500	105000	4,20,000
11	Stretchers	6	5000	30000	

EMERGENCY COMMUNICATION FACILITIES

DEPARTMENT	S.N.	DESCRIPTION	PHONE NUMBERS
	1.	Mumbai Police Control.	100.
	2.	Powai Police Station.	2570 2690.
	3.	DCP For Powai Area.	2821 0763.
POLICE.	4.	Central Police Control.	2262 0111.
	5.	Inform Police – Alert.	2262 1855.
	6.	Traffic Control.	2493 7746, 2493 7747, 24937755, 2493 7745.
	1.	Fire Station, Vikhroli.	2517 0730.
	2.	Fire Station, Mulund.	2568 7637.
FIRE BRIGADE.	3.	Fire Station, Marol.	2920 0940/ 41.
	4.	Fire Station, Andheri.	2620 5301.
	1.	Dr. LH Hiranandani.	2576 3333.
MEDICAL	2.	Powai Poly Clinic.	2578 1619.
ASSISTANCE.	3.	Rajawadi Hosp. Ghtkopar.	2509 4149.
	4.	Nanawati Hosp, SantaCruz.	2618 3654.
	1	Mantualava Cantual	2202 7990, 2202 4243, 2285 4168.
	1.	Mantralaya Control.	Ext. 3551, 1070.
AUTHORITY/	2.	Collector (Subs).	2655 6799, 2655 7807.
REGULATORY	3.	Disaster Management Control rooms (MCGM).	2270 4403, 2269 4725, 2269 4727.
AGENCIES.	4.	Disaster Help Line (MCGM EOC).	108.
	5.	Civil Defence Control, Div. No. 4, Andheri Fire Station.	2620 6791/ 92.
	6.	Home Guard Control, Div. No. 4, Andheri Fire Station.	2693 75/ 92.
SITE KEY	1.	Project Proponent.	M/s. Larsen & Toubro Limited.
PERSONNEL.	2.	Architect.	98101 23431/ 206 623 4646/ 4625.

POSTERS AND SIGNAGES





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